JANUARY '56

MODERN TEXTILES

MAGAZINE

Specializing in Rayon and Synthetic Fibers since 1925

FIBERS

FABRICS

FINISHES

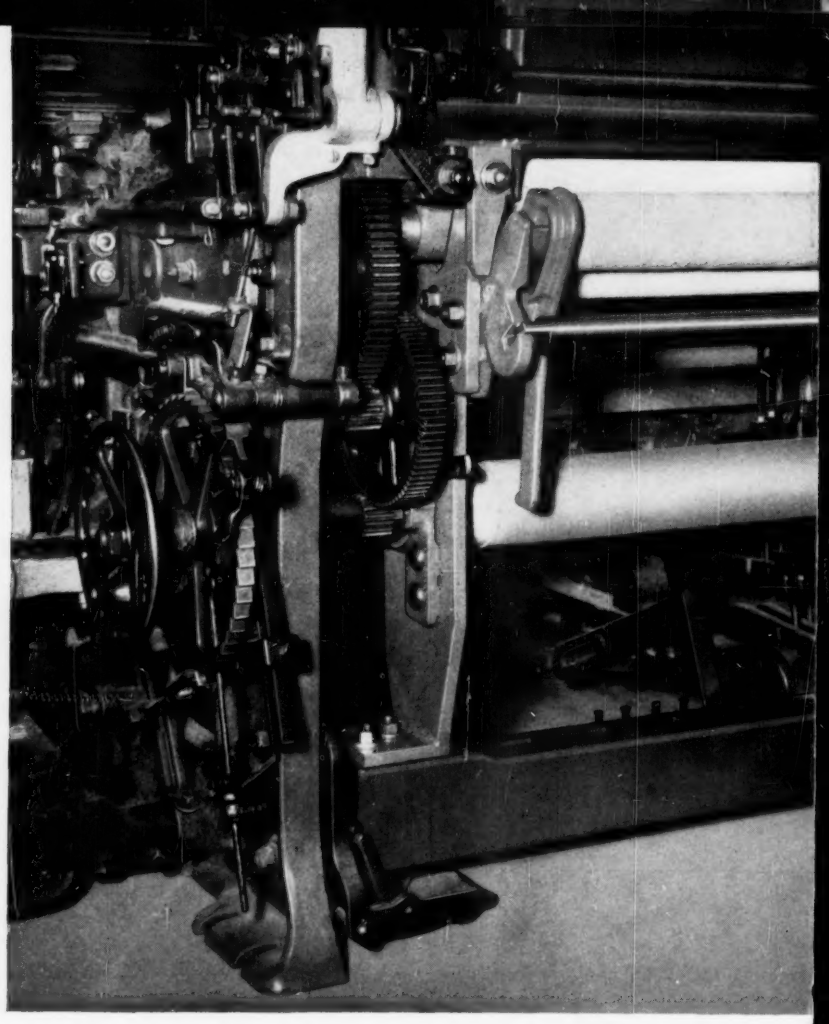
How MAX DOFT brought style to knitwear and success to Princeton Knitting. *Story page 31*

THIS MONTH'S SPECIAL FEATURES:

How to knit Fluflon socks
Data sheet on acrylic fibers
Mill tests for opening, picking
Better color mixing for prints
What millmen should know about Vicara

AND 15 MORE TIMELY REPORTS AND USEFUL ARTICLES

INCREASED LOOM VERSATILITY, EASIER DOFFING WITH NEW DRAPER TAKE-UPS

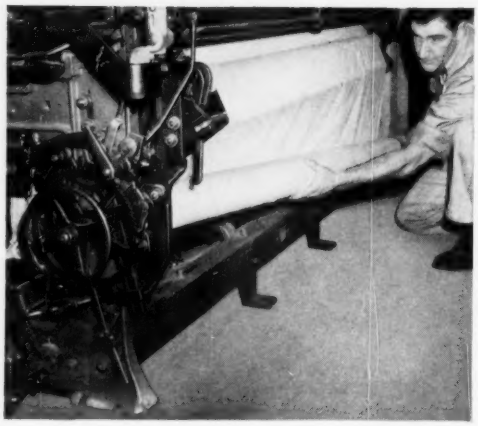


New Draper High Roll Ratchet Take-Ups now make it possible to weave synthetic goods on X-2 Model Looms.

These Take-Ups are equipped with Double Take-Up Rolls providing increased frictional surface to hold the cloth in weaving spun and filament yarns.

A separate wind-up, chain and sprocket driven from the lower Take-Up Roll, permits easy doffing. The use of a Cam Lever type Pressure Roll permits the Cloth Roll to be doffed without stopping the loom.

For application of new Draper Take-Ups and other labor saving devices consult your Draper representative . . . *today*.



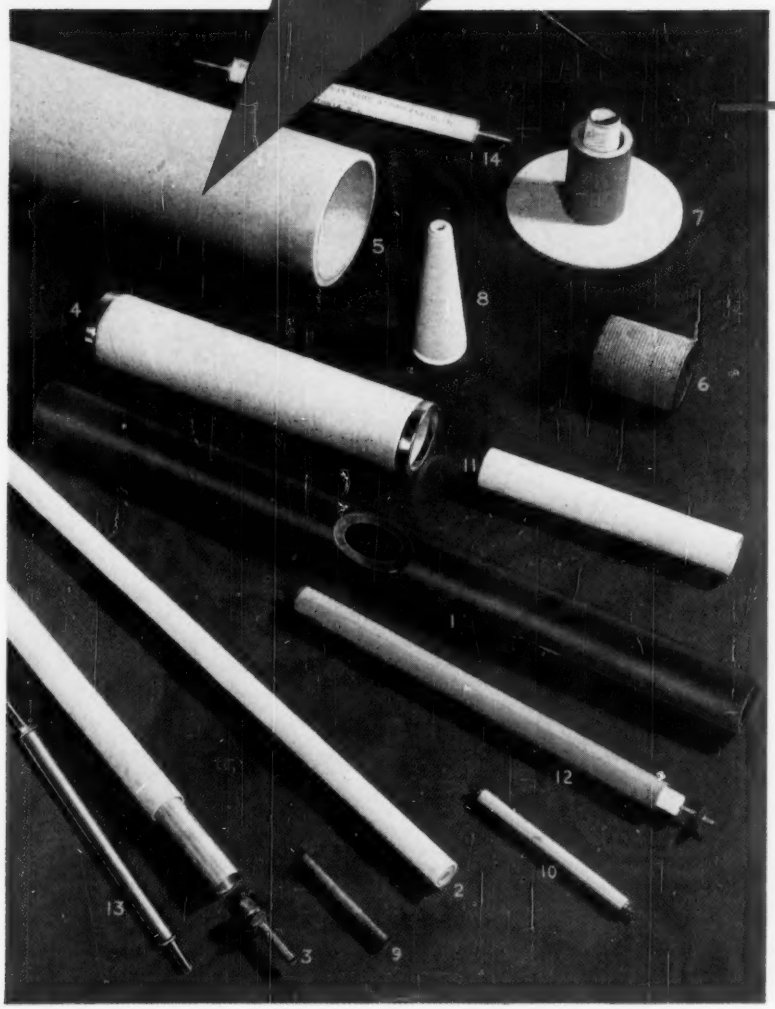
New type Pressure Roll permits doffing without stopping the loom.

DRAPER CORPORATION

HOPEDALE, MASS.

ATLANTA, GA.
GREENSBORO, N. C.
SPARTANBURG, S. C.

SONOCO PAPER *specialties*



PICTURED ABOVE—(1) tie-in tubes; (2) card clearer roll covers; (3) topping (Thompson) rolls and covers; (4) pin drafter cores; (5) loom beam repair tubes; (6) spooler cheese cores; (7) rayon cake forms; (8) cork covered cones; (9) temple roll cores; (10) self-weighted or floating roll covers; (11) roving tubes; (12) underclearer rolls; (13) aluminum ball warp mandrels; (14) ball warp tubes.

FOR THE TEXTILE INDUSTRY

If it's a problem in textiles that paper can solve, you can depend on SONOCO for exhaustive research and product development.

For over 50 years, SONOCO textile specialty products have kept pace with the ever-changing textile industry by providing greater efficiency, greater speed or reducing man hours and cost of operation.

Consult your SONOCO sales-engineer or write us direct on your particular problem.

sonoco
SERVES THE WORLD
PAPER CARRIERS
REG. U.S. PAT. OFF.

SONOCO PRODUCTS COMPANY

MAIN OFFICE — HARTSVILLE, S. C.

MYSTIC, CONN. • AKRON, IND. • LOWELL, MASS. • PHILLIPSBURG, N. J.
LONGVIEW, TEXAS • PHILADELPHIA, PA. • LOS ANGELES, CAL.
GRANBY, QUEBEC • BRANTFORD, ONT. • MEXICO, D. F.

DEPENDABLE SOURCE OF SUPPLY

SOLVAY'S 75th YEAR

As America's pioneer producer of alkalies, we are proud of the contributions Solvay has made to the dynamic growth of American Industry during the past 75 years.

It is natural to look at our 75th year as a mark of achievement.

Be assured that in the years of industrial development ahead Solvay products and service will continue to set the pace of leadership.

SOLVAY PROCESS DIVISION • ALLIED CHEMICAL & DYE CORPORATION • 61 BROADWAY, NEW YORK 6, N.Y.

MODERN TEXTILES MAGAZINE

January, 1956 · Vol. 37, No. 1

*

Formerly Rayon and Synthetic Textiles
Established 1925

* * *

Published Monthly by
Rayon Publishing Corporation
303 Fifth Ave., New York 16, N. Y.
MUrray Hill 4-0455

* * *

Francis A. Adams ..... *Chairman of the Board*
Alfred H. McCollough ..... *President*
Harvey J. Williams ..... *Vice President*
John E. D. Coffey ..... *Vice President*
Harries A. Mumma ..... *Treasurer and Secretary*

* * *

Alfred H. McCollough ..... *Publisher*
Jerome Campbell ..... *Editor*
H. George Janner ..... *Managing Editor*
Hilda Haemmerle ..... *Editorial Asst.*
Robert C. Shook ..... *Contributing Editor*
B. Mori ..... *Contributing Editor*
Joseph Fallat ..... *Art Direction*
Harvey J. Williams ..... *Business Manager*
R. A. Lipscomb ..... *Business Representative*
C. E. Peck, Jr. ..... *Business Representative*
William Walters ..... *Business Representative*
Gordon B. Ewing ..... *Business Representative*
William A. Boyd ..... *Circulation Manager*
I. A. Price ..... *Asst. Circulation Manager*

* * *

Subscription Rates: North and South America and U. S. Possessions, one year $5.00; all other countries, one year, $8.00. Postage prepaid by the publisher. Single copies (current issue), 60 cents.

BPA

Member of
Business Publications Audit of Circulation, Inc.

Entered as second-class matter at the Post Office, Manchester, N. H. Editorial and Circulation offices at 303 Fifth Avenue, New York 16, N. Y. Publication offices at 215 Canal Street, Manchester, N. H.

(Originally entered as second-class matter at the Post Office, New York, N. Y. August 20, 1925).

* * *

* Registered U.S. Pat. Office.

CONTENTS

The Principal Trade Groups

Rayon and Acetate Fibers Producers Group ..... Empire State Bldg., New York
National Federation of Textiles, Inc. ..... 389 Fifth Ave., New York
American Association of Textile Chemists and Colorists ..... Lowell Techn. Inst., Lowell, Mass.
American Association for Textile Technology, Inc. ..... 2 Park Ave., New York
Silk and Rayon Printers and Dyers Ass'n of America, Inc. ..... 1450 Broadway, New York
Synthetic Organic Chemical Manufacturers Association ..... 41 E. 42nd St., New York
Textile Distributors Institute, Inc. ..... 469 Seventh Ave., New York
American Rayon Institute ..... 350 Fifth Avenue, New York

SPECIAL ANNOUNCEMENT

Good Things Are Worth Waiting For

In our November and December issues we announced a new series of articles dealing with the effect on fabric performance of blend composition and weave. As we stated in these announcements, we expected to start the new series in this current issue. However, the Du Pont experts who are preparing these articles on blended fabrics exclusively for MODERN TEXTILES MAGAZINE, have asked us to give them a little more time. Here is how they themselves have stated their reasons for asking us to wait a few months:

"To offer the greatest benefit to the readers of MODERN TEXTILES, it has been found necessary to postpone making available the results of the Du Pont blending studies previously announced for publication. These studies, started more than two years ago, are part of continuing research to broaden and improve the use of man-made fibers in all types of textile applications. Recent investigations upon blends which are proving of significance in the textile field have so broadened the knowledge available that it is felt that presentation of the earlier material in the absence of the newer data would detract considerably from the usefulness of the report of these investigations. It is expected that the preparation of this new material will allow the start of publication in April."

We are sure you will agree that it would not have been fair to our readers to sacrifice this new and up-to-the-minute material just to make a January deadline. WATCH, THEN, FOR THE START OF OUR NEW SERIES ON BLENDS IN OUR APRIL ISSUE!

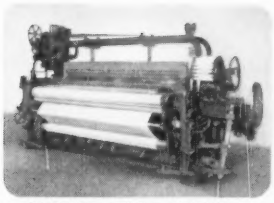
New Hartford Plant in Greenville

The Hartford Machine Screw Co. is currently installing machinery and equipment in the plant of the company's Southern Division in Greenville, S. C. The new division will provide facilities for servicing Hartford spindles operating in the South. The new plant will be stocked with spare parts for servicing Hartford customers in the southern states. According to a company spokesman, the division will be able to make parts shipments within 12 hours of receipt of orders.

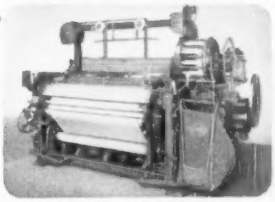
The Hartford Southern Division will be headed by A. W. Winslow as manager. W. B. Martin and A. E. Newell of the Hartford Greenville Sales Office will continue to work out of the Southern Division as sales engineers. Their headquarters will be in the plant which is located at Route 3, Box 314, Whitehorse Road North, Greenville, S. C.

Nylon Tire Cord Use Climbing

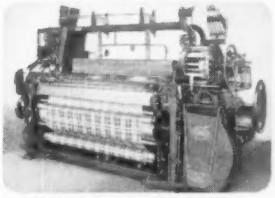
According to a Du Pont Co. survey, reported at the annual convention of the National Association of Independent Tire Dealers, the retail dollar volume of nylon tires has more than doubled in the last year and has quadrupled in just 2 years. The growing acceptance of nylon as a material for tires is indicated by reports from the industry. According to Du Pont, just a year ago there were 39 brands of nylon cord tires on the market; today there are 241—an increase of more than 500 per cent. A breakdown of those figures shows an increase in passenger tire brands from 3 in 1953 to 27 in 1954 and 86 this year. Truck tire brands during the same period increased from 4 to 12, to 155.



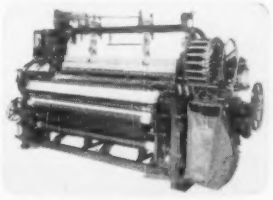
M-P 20 Harness (1/4" space) 2 x 1 box
AUTOMATIC FILLING MIXING HEAD LOOM



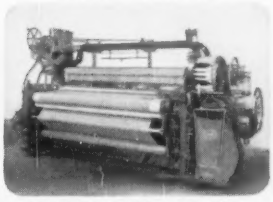
M-P 4 Harness 2 x 1 box AUTOMATIC
UNDERCAM LOOM



M-P 20 Harness (15/32" ga.) 4 x 1 box
AUTOMATIC DOBBY LOOM



M-P 20 Harness (15/32" ga.) 2 x 1 box
AUTOMATIC DOBBY LOOM



M-P 25 Harness (4/10" space) 4 x 1 box
AUTOMATIC HEAD LOOM

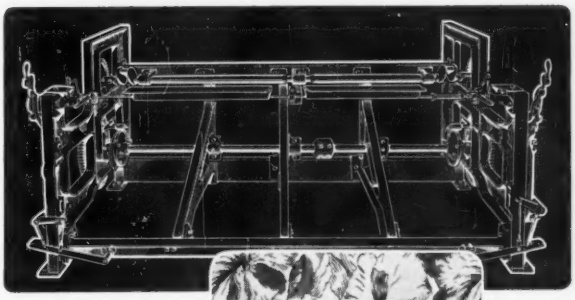
YOUR FABRIC-CONSTRUCTIONS CAN BE "TURNED ON A DIME", TOO...

WHEN YOUR WEAVEROOM IS M-P EQUIPPED

Sudden turns of fashion can't throw your balance-sheet off balance . . . when your weaveroom has the Many-sided Protection of C & K's new Multi-Purpose Looms.

For, with an adequate complement of these unique looms, you can literally "turn on a dime" . . . *convert overnight from plain to fancy constructions, or vice versa.*

C & K's new M-P design is the first to give this *complete convertibility* . . . which means More Protection and More Profit than you have ever had before. *See C & K today.*



This "Invisible Trademark" Stands Back of the Trade-marks of the World's Finest Fabrics . . . which are WOVEN Fabrics.

CROMPTON & KNOWLES *Loom works*

WORCESTER 1, MASSACHUSETTS, U. S. A.

Charlotte, N. C. • Philadelphia, Pa. • Allentown, Pa.
Crompton & Knowles Jacquard & Supply Co., Pawtucket, R. I.

Avisco Announces First Licensees Under New Integrity Plan for Apparel Fabrics

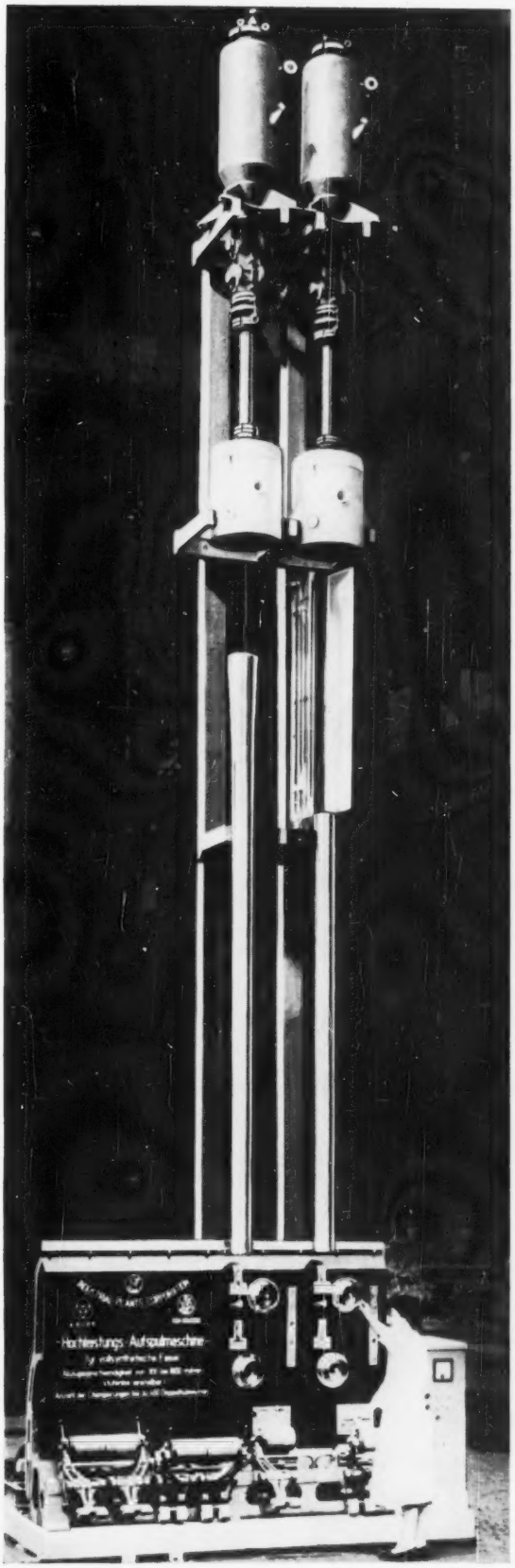
A quality control program for wearing apparel fabrics has been established by American Viscose Corp., according to an announcement last month by Arthur Wachter, manager of the company's converting relations department.

The first licensees under the new program which is called the Avisco Integrity Plan, are: First licensees are Burlington Industries, Inc., for converting and finishing; California Fabric Co., Chopak Kittenplan Corp., and L. A. Slesinger, Inc., for converting; and Housatonic Dyeing and Printing Co., Inc., Hull Dye Works, Inc., North Carolina Finishing Co., and Richmond Piece Dye Works, Inc., for finishing. Fabrics will be marketed in ready-made garments and sold retail over the counter.

American Viscose already has functioning a similar plan for rayon carpets. Under the plan, the company has already licensed 35 rug and carpet manufacturers.

American Viscose is seeking to establish a symbol of quality, Wachter said, that will be immediately recognizable to consumers as a guarantee that rayon and acetate fabrics have been properly processed. Fabrics will be individually tested by Avisco to qualify. Tests will be made according to end use and include breaking strength, shrinkage control and color fastness. The Avisco Integrity Tag will indicate whether the fabric is washable, washable at hand temperatures or dry cleanable.

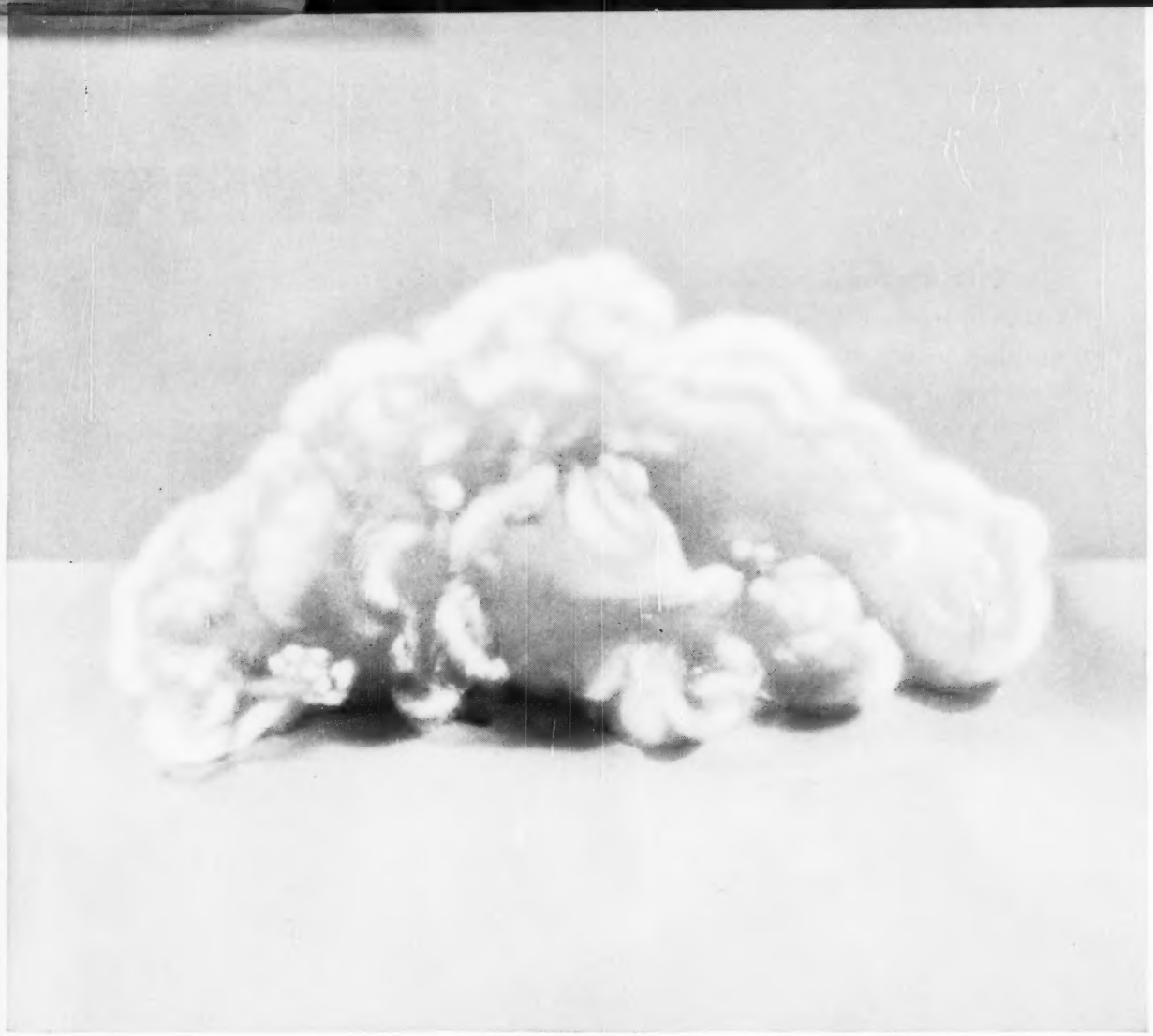
(Continued on Page 54)



the big seven

1. Brighter Luster
2. Lower Dye Costs
3. Better Crimp
4. Greater Resistance to Abrasion
5. More Resiliency with Less Crushability
6. Greater Strength
7. New Economy for You

THE NEW



Put new life in your product... bring new products to life

Nylon Staple

I·R·C

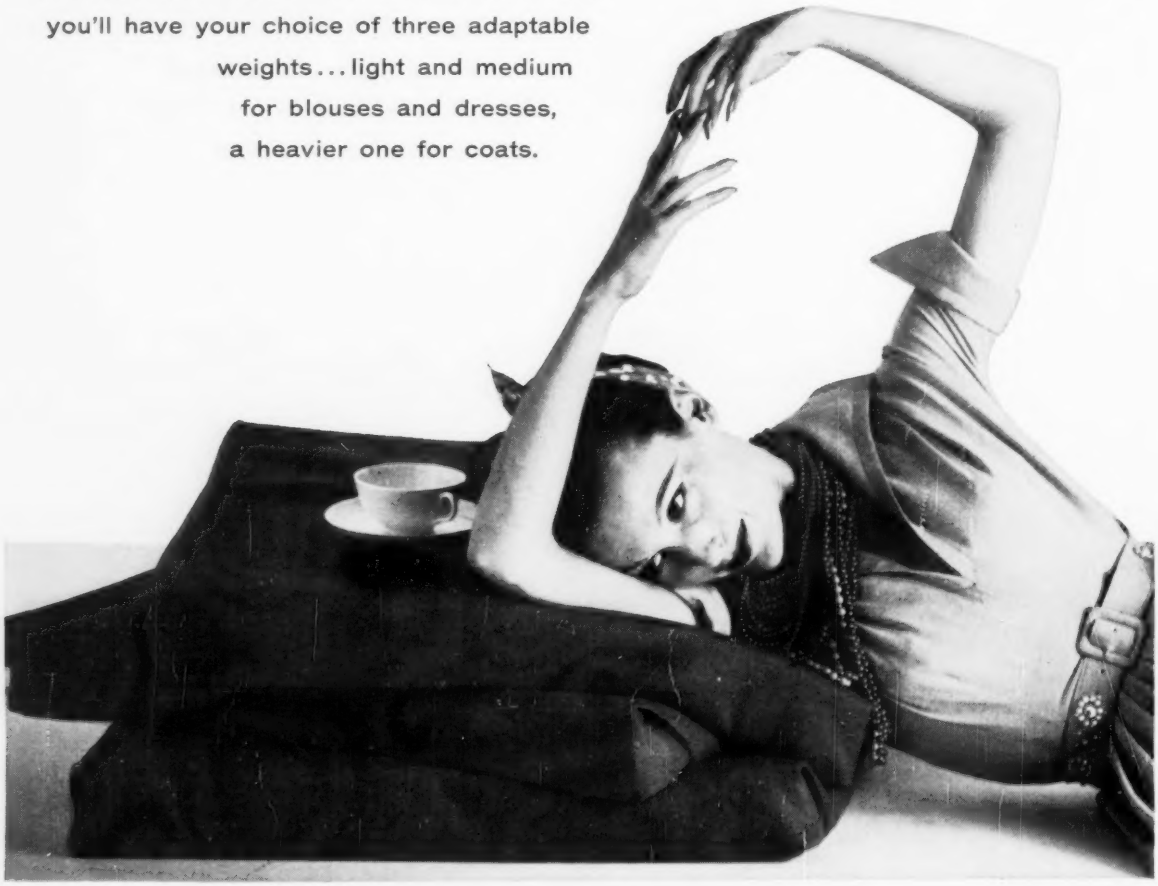
The NEW Nylon Staple, produced by IRC, has spurred creative activity in a wide range of industries. This great new fiber, capable of giving a product seven unique, highly desirable qualities, can be the means of developing important new products, or product improvements for you.

IRC's technical staff is available to work with your people, to put the Big Seven to work for you. Call us.

Industrial Rayon Corporation. Sales Offices: 500 Fifth Avenue, New York 36, N. Y. 627 Guilford Bldg., Greensboro, N. C.

WHY

This spring... next fall... you'll be more and more insistent that your jersey dresses, blouses and coats star luxurious Vicara fiber in the blend. And you'll have your choice of three adaptable weights... light and medium for blouses and dresses, a heavier one for coats.



By far the most valuable Vicara gift to a jersey blend is its soft, rich feel... the very texture of luxury itself. Once your customers **feel** jersey enriched with Vicara fiber... once they wear it (and they'll wear it for a long, long time)... that's the jersey they'll come in to buy!

Why Vicara fiber in jersey? Because it makes a good jersey better!

VICARA®
BRAND ZEIN FIBERS

IN JERSEY?

No other fiber combines so successfully with wool in a jersey that's softer, lovelier, more touch-tempting than any jersey you've ever known.

You'll marvel at the beautifully fluid drape...the quick wrinkle recovery...the excellent shape retention.

This is important...because Vicara fiber is soft and absorbent, the jersey is gloriously comfortable to wear. Directly linked with this superior advantage is the anti-static quality of Vicara fiber... this means no clinging of lint to the fabric, no unpleasant electric shocks or clinging of the fabric to the wearer.

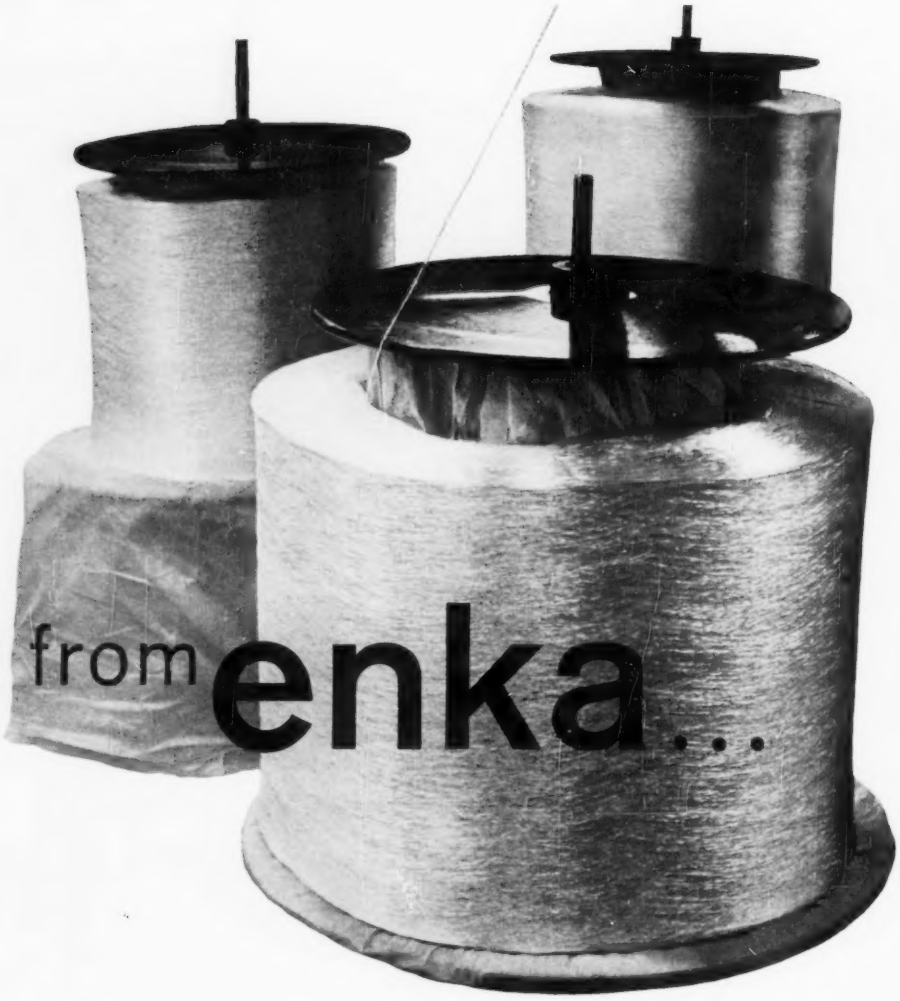
VC PRODUCTS

Vicara®
BRAND ZEIN FIBERS

THE FIBER THAT IMPROVES THE BLEND

UNIFORMITY • BEAUTY • VERSATILITY • ECONOMY • EASE IN USE • SPINNABILITY
DYE-ABILITY • WARMTH • HANDLE FEEL AND DRAPE • ELASTICITY • RESILIENCE
ABSORBENCY • HEAT RESISTANCE • WASHABILITY • NON-FELTING • NON-ITCHING
NO ODOR • NO KNOWN ALLERGIES • MOTH RESISTANCE • MILDEW RESISTANCE

For sources, write
Virginia-Carolina Chemical Corporation, 99 Park Avenue, New York 16, N. Y.



only from **enka**...

THREE-POUND KNOTLESS CAKES WITH THESE MAJOR ADVANTAGES

Greater Efficiency Enka's 3-pound knotless cakes... the largest in the industry ... insure longer runs—fewer doffs.

Greater Economy Priced lower than cones, much more efficient than smaller cakes—Enka's 3-pound knotless packages offer significant savings.

Improved Quality Because Enka's 3-pound knotless cakes are shipped in open form, and because they require less handling, improved fiber quality is assured, resulting in superior fabrics.

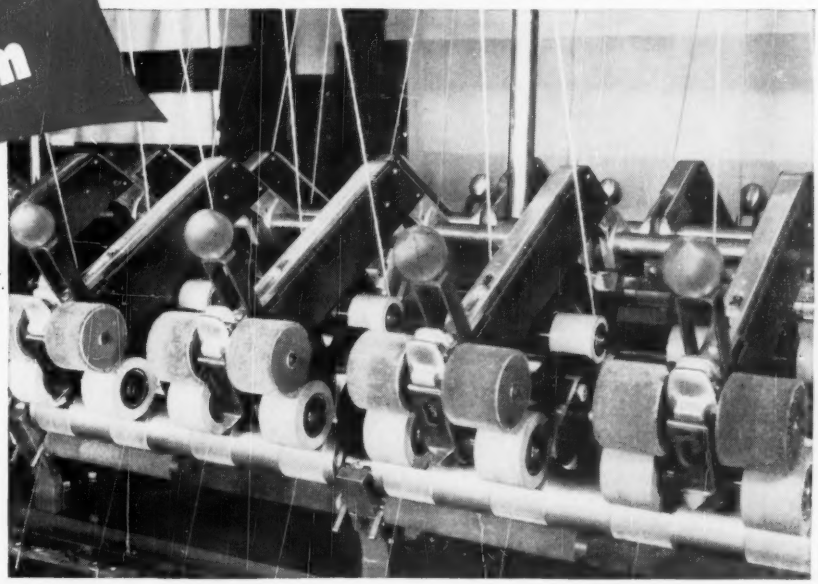
AMERICAN **enka** *CORPORATION*

206 Madison Avenue, New York 16, New York

Sales Offices: 871 McCallie Avenue, Chattanooga, Tennessee
428 Jefferson Standard Building, Greensboro, North Carolina
2001 Industrial Bank Building, Providence, Rhode Island

American System

Latest top roll weighting arrangement on Whitin American Superflex Spinning Frame. Can be furnished with Quik-Set ratch changing mechanism.



only 3 machines

- Whitin Roto-Drafter
- Whitin Quik-Set Roving
- Whitin American Superflex Spinning

no more than 5 processes

1. Roto-Drafter (1, 2 or 3 processes)
2. Roving
3. Spinning

The most economical way of producing high quality yarns from wool, synthetics, or blends of both from staple up to 8¾". Investigate now to find out how leading mills are profiting from these new Whitin machines.

P.S. Your present roving and spinning machines may be changed over if you wish.

Whitin MACHINE WORKS

WHITINSVILLE, MASSACHUSETTS

CHARLOTTE, N. C. • ATLANTA, GA. • SPARTANBURG, S. C. • DEXTER, ME.

AlSiMag® Guides have the RIGHT COMPOSITION FOR EACH JOB!

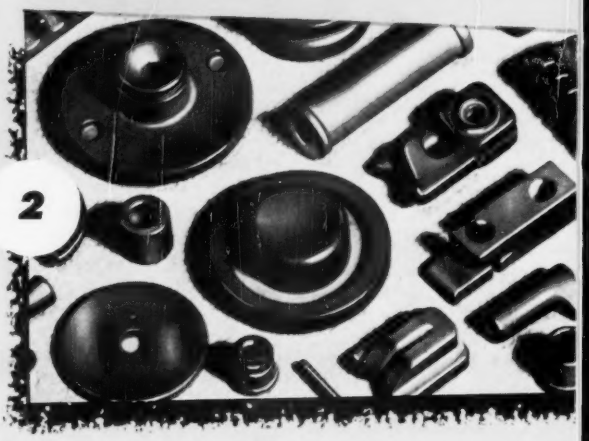
Including new, harder AlSiMag Aluminas

LONGER LIFE. For years AlSiMag guides in various materials have set long life records. Hard. Homogeneous. Highly resistant to wear.

MORE MATERIALS. AlSiMag 192 and 193 are regarded as industry standards — answer most guide requirements for producing and processing synthetic fibers. Have solved more guide problems than any other compositions. However, for top performance, some guide applications need special material characteristics, including finishes not readily changed by usage. For especially severe conditions, AlSiMag has developed a family of Alumina ceramics . . . hardest and most durable yet! AlSiMag 491, 513 and the new 614 provide a complete range of desirable traits for such exacting requirements.

VOLUME PRODUCTION. Demand has multiplied for every type AlSiMag guide. Accelerated output keeps pace. The finest production facilities operate around-the-clock, including huge, high-temperature, continuous-fire kilns which help achieve the **superior physical, dimensional** and **finish** characteristics of AlSiMag guides. A sizable plant section is now devoted exclusively to processing and firing AlsSiMag Aluminas.

AlSiMag's wider range of versatile materials permits selection of the **right** composition for every guide application! Over half a century's "know how" devoted to each order.



1. AlSiMag 192, cream colored, standard of the industry. ***2***. AlSiMag 193, metallic gray, a conductor of electricity. ***3***. Typical AlSiMag 491 Alumina guides, blue in color, which enjoy such an industry wide reputation for wear resistance. ***4***. Guides in AlSiMag 513, an extremely hard pink material developed for slightly different applications. ***5***. Guides in new AlSiMag 614, a white material — the hardest yet produced.

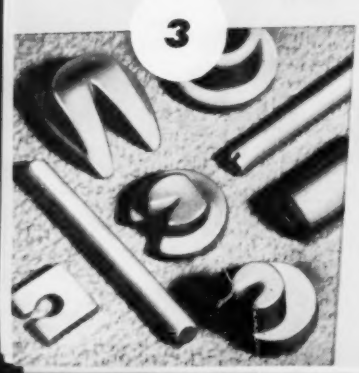
To meet — and usually exceed — the most exacting requirements, use AlSiMag guides. Complete information and samples on request.

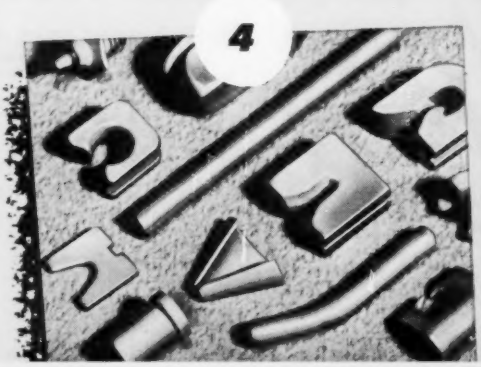
54TH YEAR OF CERAMIC LEADERSHIP

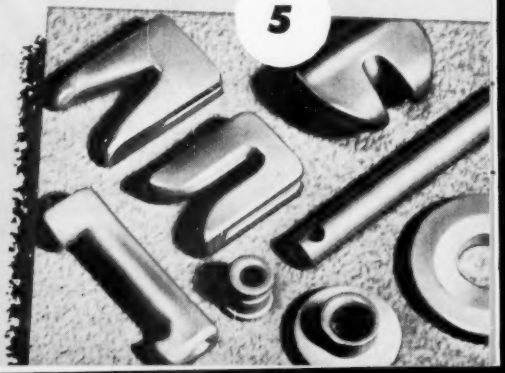
AMERICAN LAVA CORPORATION

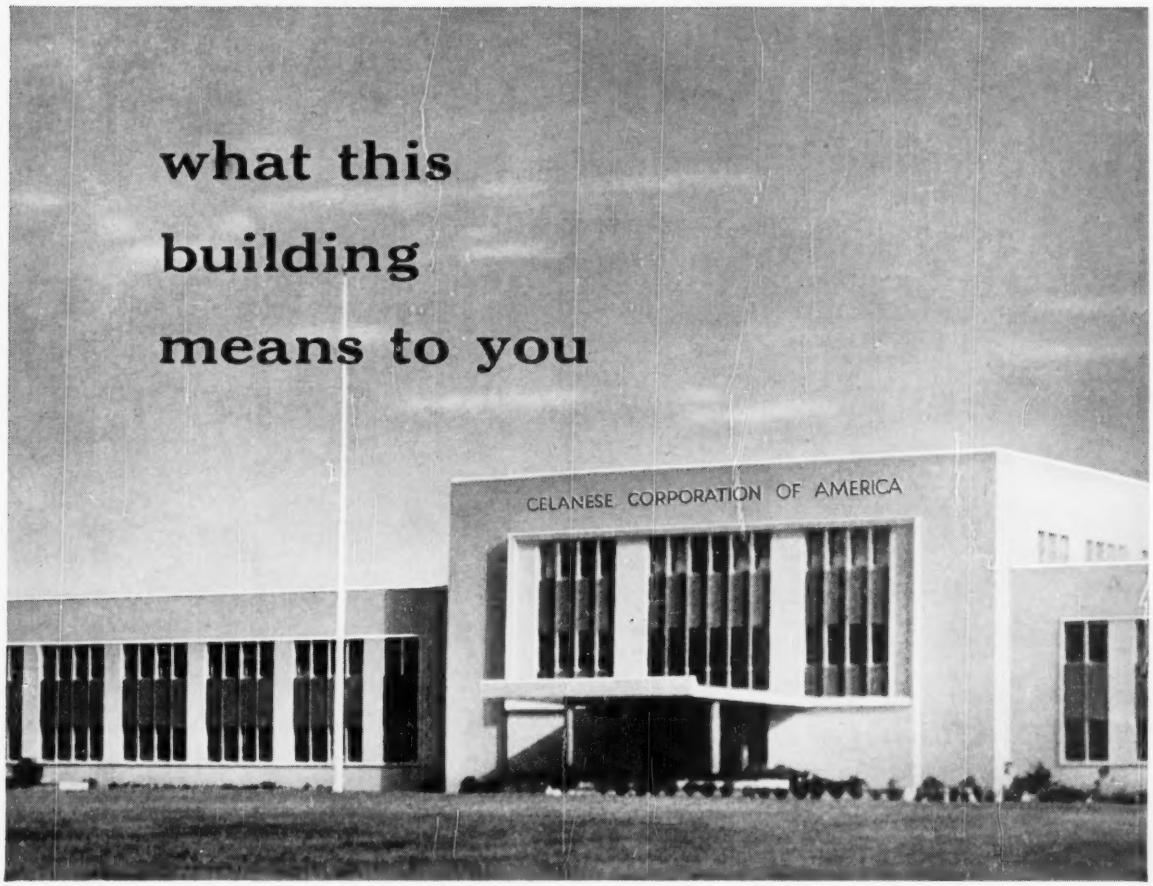
CHATTANOOGA 5, TENNESSEE
A Subsidiary of
Minnesota Mining and Manufacturing Company

SALES ENGINEERS: NORTHEAST: J. S. Gosnell, 671 Broad St., Newark, N. J., Mitchell 2-8159. NORTH CENTRAL: Minnesota Mining & Mfg. Co., 367 Grove St., St. Paul 1, Minn., Cedar 3071. NORTHWEST: Minnesota Mining & Mfg. Co., 320 Shaw Rd., S. San Francisco 10, Calif., Plaza 6-0800. SOU. CALIF.: W. L. Thompson, 5603 N. Huntington Dr., Los Angeles 32, Capitol 1-9114. SOUTH CENTRAL: J. A. Green ,137 Parkhouse, Dallas 7, Tex., Riverside 3266. SOUTHEAST: J. E. Spearman, American Lava Corp., Chattanooga 5, Tenn., 5-3411. ALL OTHER AREAS: J. B. Shacklett, American Lava Corp., Chattanooga 5, Tenn., 5-3411. REPRESENTATIVES: CANADA: Ian M. Haldane & Co., P. O. Box 54, London, Ont. CONTINENTAL EUROPE: P. C. Huguenin Luzern, Gerbergasse 6, Luzern, Switzerland. JAPAN & SOUTH KOREA: The American Trading Co. (Japan) Ltd., SKF Bldg., No. 1, Shiba Park, 7-Gochi, Minato-Ku, Tokyo, Jap. SOUTH AFRICA: White, Child & Beney (South Africa) Pty. Ltd., P. O. Box 632, Electron House, Acutt St., Durban. ALL OTHER EXPORT: Minnesota Mining & Mfg. Co., Internat'l Div., 99 Park Ave., N. Y.









This building is the headquarters of the Textile Division of Celanese Corporation of America in Charlotte, North Carolina. Here are consolidated in one place the sales, spinning, weaving, dyeing and finishing specialists from Celanese operations all over the country.

Facilities have recently been expanded to include an Applications and Product Development Laboratory.

We are proud to say it is the most complete laboratory ever attached directly to a textile industry marketing operation. It will conduct experimental work to help every type of mill operation. Some examples:

1. **The developing of data on temperature controls required in the heat treatment phase of finishing Arnel* triacetate fabrics.**
2. **New constructions possible with Fortisan*-36 rayon.**
3. **Detailed information on chemical, physical, or electrical characteristics of yarn.**
4. **Customer production problems.**

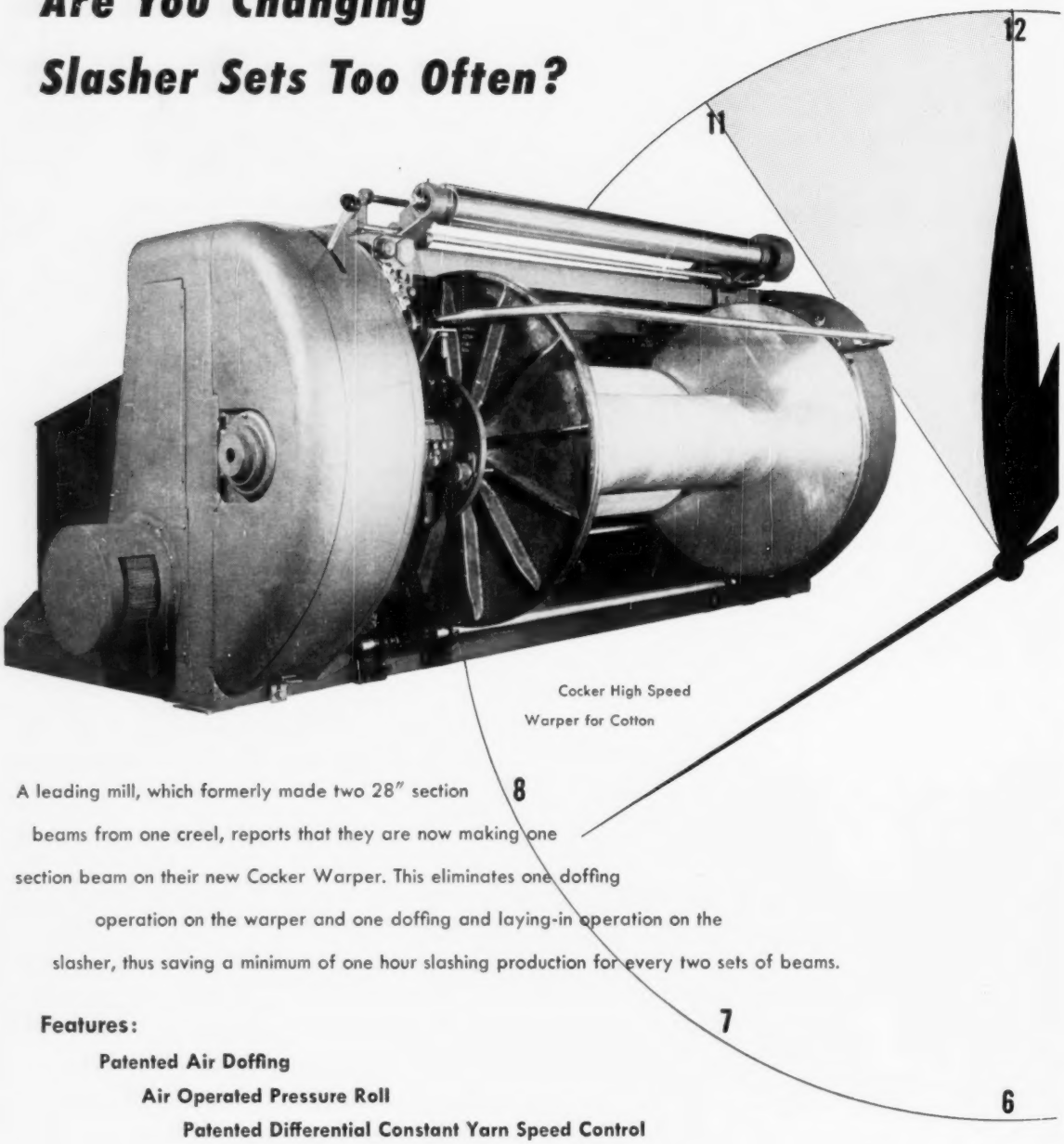
We feel sure a closer understanding and solution of mill problems will result from this consolidation, particularly the ability to see all phases of a problem at the actual time a product is being developed.

This is part of the program of Celanese Corporation of America to provide the best possible help and service to its customers. *Reg. U.S. Pat. Off.

Celanese

CORPORATION OF AMERICA, N.Y. 16.

Are You Changing Slasher Sets Too Often?



Cocker High Speed
Warper for Cotton

A leading mill, which formerly made two 28" section beams from one creel, reports that they are now making one section beam on their new Cocker Warper. This eliminates one doffing operation on the warper and one doffing and laying-in operation on the slasher, thus saving a minimum of one hour slashing production for every two sets of beams.

Features:

Patented Air Doffing

Air Operated Pressure Roll

Patented Differential Constant Yarn Speed Control

Rheostat Control of Operating Speed

Individual Braking of Beam Pressure Roll and Carrier Roll by Rheostat Control

Practically Vibrationless at Speeds up to 1000 Yards per Minute

Takes Beam Flange Diameters up to 40 Inches.

Write or wire for full information.

THE LEADER
COCKER
AROUND THE WORLD

Machine and Foundry Co., Gastonia, N. C.

WORLD'S LARGEST DESIGNERS AND BUILDERS OF COMPLETE WARP PREPARATORY EQUIPMENT

Soromine AT

This new white amphoteric softener is ideal for treating dyed, printed or white bleached textiles . . . whether manufactured from animal, cellulosic or synthetic fibers. Besides imparting a full, smooth hand with good body, it reduces static electricity and gives excellent lubricity to yarns.

Being an ampholyte, SOROMINE®AT can function either as a cationic softener in acid liquors, or as a non-ionic and/or anionic softener in neutral and alkaline liquors. Application on yarns and piece goods is simple, since its exhaust can be controlled by pH adjustment.

It can be applied on quetch or pad, in pressure machines, jigs or overhead reel machines. It is compatible with the usual finishing ingredients — such as urea formaldehyde and melamine resins, starches, sulfonated oils, dextrin, etc. Other advantages of SOROMINE AT are its resistance to yellowing and discoloration, and lack of effect on light fastness of dyed fibers.

Our application engineers will be glad to help you incorporate SOROMINE AT softening into your finishing process. Write today for booklet with complete information.

From Research to Reality

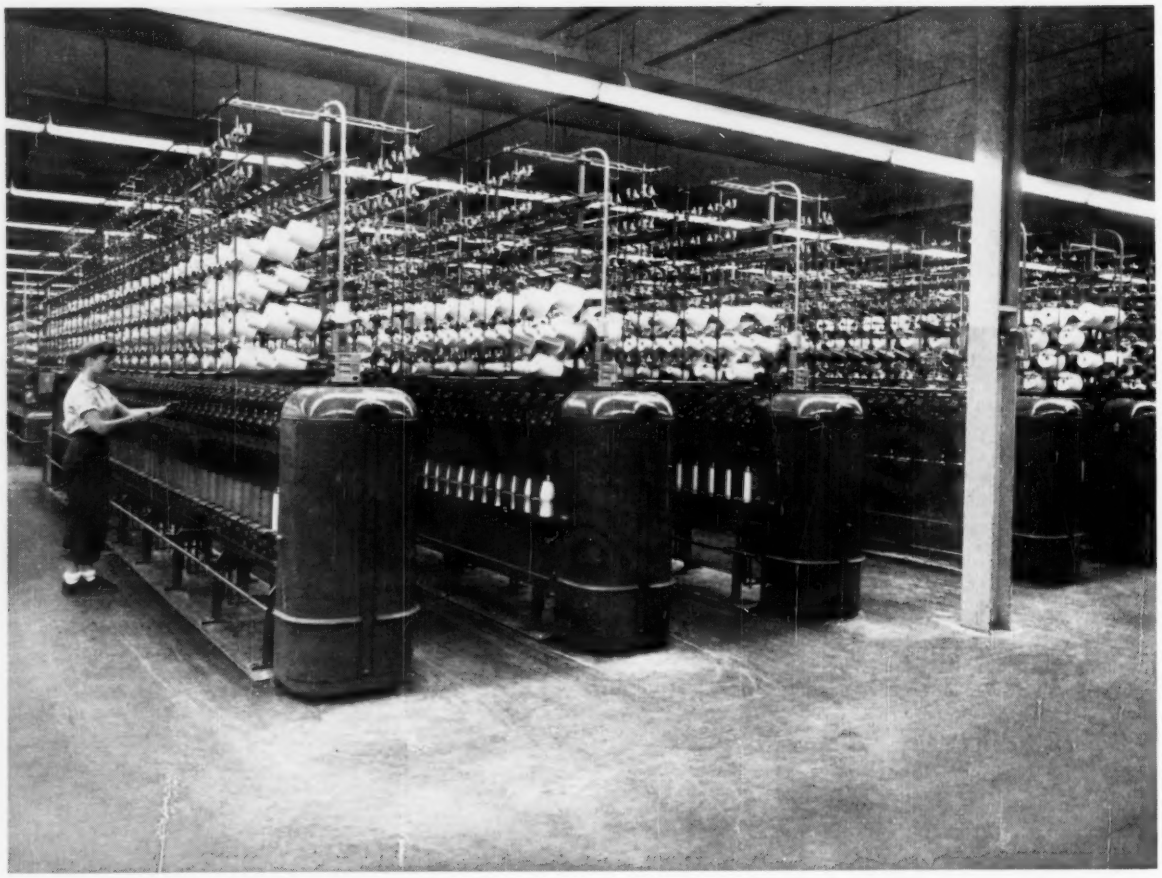
ANTARA® CHEMICALS

A SALES DIVISION OF GENERAL ANILINE & FILM CORPORATION

435 HUDSON STREET • NEW YORK 14, NEW YORK

SALES OFFICES:

New York • Boston • Providence • Philadelphia • Charlotte • Chattanooga • Chicago • Portland, Ore. • San Francisco • Los Angeles • IN CANADA: Chemical Developments of Canada, Ltd., Montreal



Leesona Model 10 Ring Twisters at the Chatham Manufacturing Company mill in Elkin, N. C. Part of a Leesona 2600-spindle installation used in producing the famous Chatham automotive and apparel fabrics.

Why CHATHAM selected Leesona® Ring Twisters

Mill executive tells how Model 10 machines help maintain quality and cut production costs

Carlyle Summey, Worsted Division Manager at Chatham, says:

"Our fabrics require many combinations of yarns — natural, synthetic and metallic, in ply constructions of from 2 to 6 ends. Leesona Model 10 Ring Twisters do a great job of top-quality twisting for us. Their single and ply end individual stop motions and individual tensioning of each end in the creel make the perfect combination for high efficiency twisting. We get big, well formed take-up packages from our Model 10's — and we get them fast, which saves us time and money in our subsequent coning, quilling and warping operations.

Investigate Leesona Machines

Get *all* the facts. Find out how Model 10 Ring Twisters, or other Leesona Machines, can cut your operating costs and improve your product quality. See your Universal representative or write direct.

23.5.20

UNIVERSAL WINDING COMPANY

P. O. BOX 1605, PROVIDENCE 1, R. I.

Sales Offices: Boston • Philadelphia • Utica • Charlotte • Atlanta • Los Angeles
Montreal, Hamilton, Canada

Winding and Twisting Machinery for Natural and Synthetic Yarns

are your possible savings on 73% caustic soda going down the drain?

Increases in freight rates over the past several years make it highly advantageous for you to re-examine the form of caustic you are buying.

A little figuring right now may save you thousands of dollars next year alone. Some of our customers who have converted from 50% to 73% have realized annual savings ranging from $2,650 to over $35,000.

Your location and the volume of caustic soda you use naturally influence the amount of your savings. But small and large users alike can frequently save substantial amounts now going down the drain.

Savings also are often possible with customers who buy solid and flake caustic.

The important thing is to do something about it now. It will cost you nothing to find out. Our Technical Service Department will be glad to assign one of its specialists to discuss your individual case, to make recommendations and to estimate your annual savings.

Write today to our Caustic Soda Department at the Pittsburgh Office.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY

ONE GATEWAY CENTER · PITTSBURGH 22 · PENNSYLVANIA

DISTRICT OFFICES: Cincinnati • Charlotte Chicago • Cleveland • Boston • New York St. Louis • Minneapolis • New Orleans Dallas • Houston • Pittsburgh • Philadelphia San Francisco

IN CANADA: Standard Chemical Limited and its Commercial Chemicals Division

Stehedco GYROTEX*

Textile Bobbins

THE QUALITY IS BUILT RIGHT IN

- HAS THE SMOOTH BALANCE OF A GYROSCOPE
- PERFECT CONCENTRICITY WITH THE SPINDLE
- HAS THE GREATEST STRENGTH EVER OFFERED
- MADE OF HIGHEST QUALITY MATERIALS AVAILABLE
- LONGEST PERFORMANCE WITH SUPERIOR SERVICE

GYROTEX* MEANS THE VERY BEST BOBBIN THAT IS ENGINEERED BY TEXTILE SKILL FOR EXACTING TEXTILE NEEDS

ALL METAL STRUCTURAL CORE
FINEST BUSHINGS FOR SPINDLE CARE
TOUGH HEADS AND BARREL
PRECISION DIMENSIONS WITH UNIFORMITY
FINISH THAT QUALITY YARNS DESERVE

RIGID CONSTRUCTION PREVENTS TRAPPING
ENGINEERED FOR STEAMING
ALL TYPES AND SIZES AVAILABLE
TWISTERS, WINDER-SPINNERS, PIRNS
FOR STRAIGHT AND TAPERED SPINDLES

***GYROTEX NAME AND CONSTRUCTION PATENTED**

YOU SAVE WHEN YOU BUY STEHEDCO QUALITY

STEEL HEDDLE MFG. CO.

2100 WEST ALLEGHENY AVENUE **PHILADELPHIA 32, PENNSYLVANIA**

1-5-1

HAYES INDUSTRIES, INC.

The World's Largest Producer of Light Metal Beams

JACKSON, MICHIGAN

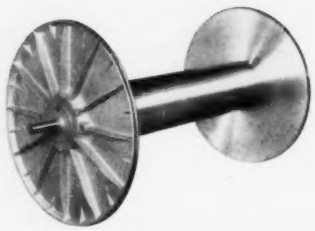
SOUTHERN REPRESENTATIVE:
R. E. L. Holt, Jr. & Assoc.
Greensboro, N. C.

EASTERN REPRESENTATIVE:
J. Paul Laird
Philadelphia, Pa.

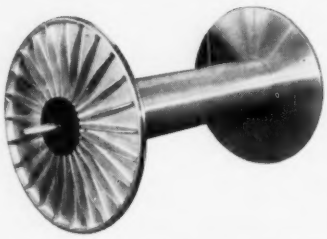
NEW ENGLAND REPRESENTATIVE:
J. S. Fallow & Co.
New Bedford, Mass.

CANADIAN REPRESENTATIVE:
J. S. Fallow & Co.
Montreal, Canada

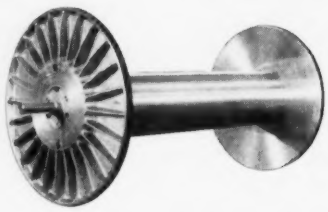
HAYES LIGHT METAL BEAMS cut costs in modern textile production, and help toward *higher profits* due to true running, perfect balance, elimination of snagging or catching with the highly polished finish of inside head faces, rust-proof construction, low maintenance costs, and fewer fabric rejects. Illustrated are only a few of HAYES LIGHT METAL BEAMS for standard production purposes. Our skilled engineering staff can help you. *Write, phone, or wire us your problem today.*



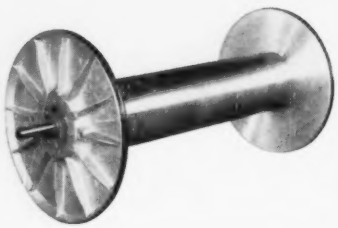
HAYES 38" x 54½" Aluminum Section Beam for cotton and spuns. Lightweight 207 lbs. Capacity, net weight of yarn 1,050 lbs.



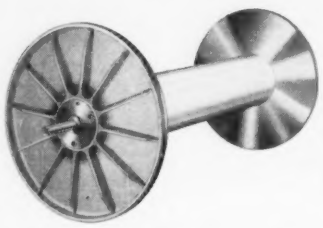
HAYES 36" x 54½" Heavy Duty Aluminum Section Beam for acetate, spuns, and cotton. Can be adapted to all standard warpers.



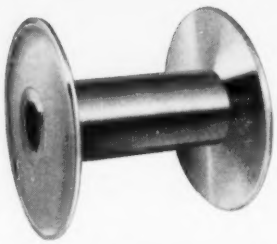
HAYES Heavy Duty Section Beam for nylon. Can be furnished in 30" and 32" diameter heads. Barrel diameter 11¾". ½" minimum wall.



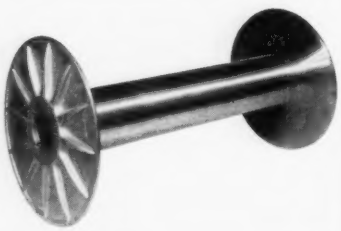
HAYES Bolted Type Section Beam for acetate. 30" x 54¼". 11¾" diameter barrel. Can be adapted to all standard warpers.



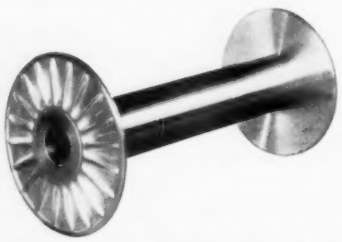
HAYES Aluminum Section Beam for acetate. Screwed type. Head sizes 26", 28", 30", 32". 54¼" traverse. 11¾" diameter barrel. Can be adapted to all standard warpers.



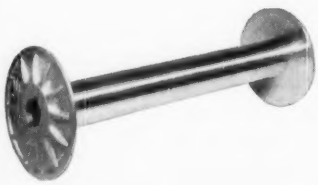
HAYES 21" Aluminum TRICOT Beam for nylon. Barrel size 7¾" diameter. Head thickness 1". Furnished in ⅜" and ½" wall. Bored for 4½" shaft. Keyways 9/16".



HAYES 21" Aluminum TRICOT Beam for acetate. Barrel 7⅜". Head thickness 1". Any desired traverse. Bored for 4½" shaft. Keyways 9/16".



HAYES 21" Heavy Duty Forged Head Aluminum TRICOT Beam for nylon. Head thickness 1¼". Barrel 7¾". ½" wall. 39-7/16" traverse. Bored for 4½" shaft. Keyways 9/16".



HAYES 13¾" diameter Aluminum TRICOT Beam for acetate. Barrel size 4.925" diameter. Made in head thicknesses of 39/64" and 1". Traverse dimensions to suit. Bored for 2¾" shaft. Keyways 9/16".

HAYES manufactures a variety of Aluminum Loom Beams to fit Draper, and Crompton & Knowles looms, for acetates, spuns, and nylon. These can be manufactured with fixed or adjustable heads in sizes from 22" to 32" diameters.

Let's take a second look at "seconds"

There's probably more second-guessing about "seconds", than on any other industry problem. Everyone is a Monday morning quarterback ...and it's the millman who takes the rap. Every time.

But no millman can turn out consistently first quality goods with a yarn that readily develops puff balls, breaks and knots or has a fixation for uneven dyeing.

For the record...IRC's Continuous Process Rayon yarn has a consistent record for cutting down seconds and increasing mill efficiency. It's the yarn that's specified for "critical" fabrics in most important mills.

When your cost per yard of first quality goods is upped by the number of "seconds" ...it just seems to make good sense to put all of your fabrics on the "critical" list.

Reference Chart

of

BEMBERG® RAYON NOVELTY-YARNS

TYPE YARN	DESCRIPTION	DENIERS	FUNCTION	FABRIC END-USE
SHORT NUBBI NUBBI INTERRUPTED SERIES	High-low, non-mechanical, short entangled slub, irregular in size and spacing. (Also specials running part slub, part smooth).	150-200-300 400-600-800	Filling with silk, cotton, acetate, nylon, Chromspun*, Fortisan*, Dacron*, or Orlon* warps.	Lower deniers in dress and blouse fabrics. Heavier deniers for draperies, upholstery, bedspreads.
TYPE "B" CUPIONI	Longer entangled slub, irregular in size and spacing, but mechanically controlled for the Douppioni silk-look.	50-70-100 150-275-450 600	Filling with silk, cotton, acetate, nylon, Chromspun, Fortisan, Dacron, or Orlon warps.	Dress, blouse, and shirt fabrics.
LONG TYPE "A" SLUB	Long, parallel, non-entangled slub for the true thick and thin look. Soft hand.	275-450-600 900-1250-1600 2500	Filling with silk, cotton, acetate, nylon, Chromspun, Fortisan, Dacron, or Orlon warps.	Lower deniers in dress and blouse fabrics. Heavier deniers for draperies, upholstery, bedspreads.
TYPE "C" LONG SLUB WARP YARN	Long thick and thin, similar to Type "A" but filaments are more closed, making it suitable for warp or filling.	150-275-450 600-900-1250 2500	Both warp and filling. Warp with any filling, including Bemberg nubbi-yarns. Plied with spun flake yarns for warp and filling.	Warp and filling for dress and blouse fabrics. Warp with any filling for drapery, upholstery, and bedspread fabrics. Plied with spun flake yarns for men's suitings.
MEASLE YARN	Part tight, part loose filaments with different shrinkage . . . forming loop or boucle effect. In weaving, loops break through surface of fabric for decorative dot effect.	1200-2000-3000	Filling with silk, cotton, acetate, nylon, Chromspun, Fortisan, Dacron, or Orlon warps.	Lower deniers as filling in dress and blouse fabrics. Heavier deniers for upholstery, draperies, bedspreads.
STRATA SLUB MULTI-STRATA SLUB MULTI-MULTI STRATA DREAM SLUB	Torpedo shaped slubs spaced: Strata, 9' apart; Multi-Strata, 6' apart; Dream, 18" apart. Multi-Multi Strata, 6' apart but shorter slubs than Multi-Strata.	150-275-450 600-900-1250 2500-5000	Filling with silk, cotton, acetate, nylon, Chromspun, Fortisan, Dacron, or Orlon warps.	Upholstery, draperies, bedspreads.
FLAKE SLUB	Short, entangled slub similar to flake slubs made with staple yarn. This yarn must be plied with a supporting end for commercial running.	300-600	Filling with silk, cotton, acetate, nylon, Chromspun, Fortisan, Dacron, or Orlon warps. As multi-colored decorative yarn. Plied with any Bemberg yarn.	Upholstery, draperies, bedspreads.
SPUN PLIED FLAKE	Part of the end running normal and part running with flake slub. Similar in softness and appearance to other flake, and will run in filling without being plied with a straight yarn.	300-600-900	Filling with silk, cotton, acetate, nylon, Chromspun, Fortisan, Dacron, or Orlon warps. As multi-colored decorative yarn. Plied with any Bemberg yarn.	Upholstery, draperies, bedspreads.
GLITTER	A monofilament yarn with a metallic appearance.	300-450	Filling with silk, cotton, acetate, nylon, Chromspun, Fortisan, Dacron, or Orlon warps. As multi-colored decorative yarn. Plied with any Bemberg yarn.	Decorative purposes in all fabrics.

* *Chromspun, Fortisan, Dacron and Orlon are registered trade-marks.*

BEMBERG® RAYON NOVELTY-YARN COLORS:

Natural for piece-dyed fabrics. 33 direct skein-dyed colors for loom-finished fabrics. In addition to direct colors, all the above yarns can be skein-dyed in sunfast or vat colors.

AMERICAN BEMBERG · Main Office: 261 Fifth Avenue, New York 16, N. Y. · Plant: Elizabethton, Tenn.

MODERN
TEXTILES MAGAZINE

JANUARY, 1956
Volume 37, Number 1

Publisher's Viewpoint

The American Textile Industry Must Protect Itself

The decision of the Japanese government to impose restrictions on exports of cottons to the United States has been generally accepted by the American textile industry as a hopeful sign. Industry spokesmen have expressed gratification that the Japanese are apparently aware of the dangers to their future trade with the United States which can be brought on by a too aggressive export policy.

There can be no doubt that the Japanese, in imposing quotas on their own cotton goods exporters, are certainly well advised. Who can doubt that a continuation of cotton imports from Japan at the rate of acceleration they have shown in past months would in time lead to Congressional action despite the strange reluctance of the State Department to safeguard the American textile industry?

But granting that the Japanese move toward self-restraint is a step in the right direction, it is only elementary wisdom on the part of the American textile industry to view the move with deep reservation. There are strong reasons at this time to have little hope that Japanese self-restraint will remove the danger to our industry of Japanese imports.

To begin with, there is the great weakness in relying on a foreign source, beyond the reach of our laws, to abstain from inflicting harm on our American textile industry. Why should the great American textile industry be dependent for its continued good health upon a foreign government no matter how friendly and well disposed such a government may be? The government of the United States should be willing to enact laws that will protect its own vitally necessary textile industry from the destructive erosion of competition from countries with lower wage scales.

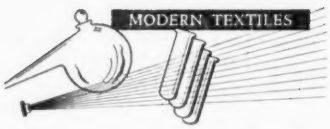
Then for the man-made fibers branch of the textile industry there is another danger in the limitations that Japan seems willing to place on cotton exports to the United States. With cotton output voluntarily cut back, the industrious Japanese may shift spindles and looms to rayon, acetate, nylon and other man-made fibers. Having placated the American cotton people, they may press the export of synthetics into this country. Let it not be forgotten that the tariff advantages which make it profitable for the Japanese to sell cottons here make it equally profitable for them to sell synthetics here. This fact should serve as a compelling reason why manufacturers of man-made fiber fabrics should not be satisfied to accept Japanese self-restraint as a solution to the problem of cut-price Japanese imports.

It would seem therefore to be simple comon sense that the defense of the American textile industry against ruinous competition must be a defense which is enforceable by the United States. And it should be a defense which extends to all sections of the industry. As was pointed out on this page in our July issue last year, the defense against cut-price imports should be a concerted, industry-wide action achieving results that benefit all sections of our industry—processors of man-made fibers as well as processors of cotton.

A. J. McCullough

PUBLISHER

OUTLOOK in textile marketing



By Robert C. Shook
Textile Economist

Textile Sales Volume Distorted—The year 1955 has been a year of vigorous recovery in demand and production for most textile apparel items. However, during the course of the year, certain developments have tended to distort the usual seasonal pattern of sales, and this is bound to affect next year's textile distribution in several important respects.

First of all, a careful distinction must be made between wholesale and retail levels.

Retail sales picked up momentum during 1955, finishing out the Holiday season with a record volume.

Wholesale activity, on the other hand, showed a different and more devious course in 1955. First quarter business was good, and second quarter business was even better. But second quarter business was, to some extent, speculative, with many buyers anticipating, and attempting to discount, increases in wage rates and the higher minimum wage schedule to go into effect early in 1956. During the last two quarters there was a distinct letdown in new orders for many staple textile and apparel items

Retail Buying Should be Strong—Because retail sales have exceeded most retailers' estimates during the latter part of 1955, and because retail buying during the past six months has been on a conservative basis, retailers as a whole will probably end up the year with as low a stock/sales ratio as had existed in some time.

Retail buying during the first quarter of 1956, therefore, can be expected to show a more than seasonal increase. Purchases by retailers will be stimulated by three different but somewhat related factors:

a) Actual needs will be greater because of low stock/sales ratios at the end of the year;
b) buying psychology will be optimistic because of the high level of Holiday sales; and
c) buying in some cases will be stimulated by reports from sellers of developing shortages.

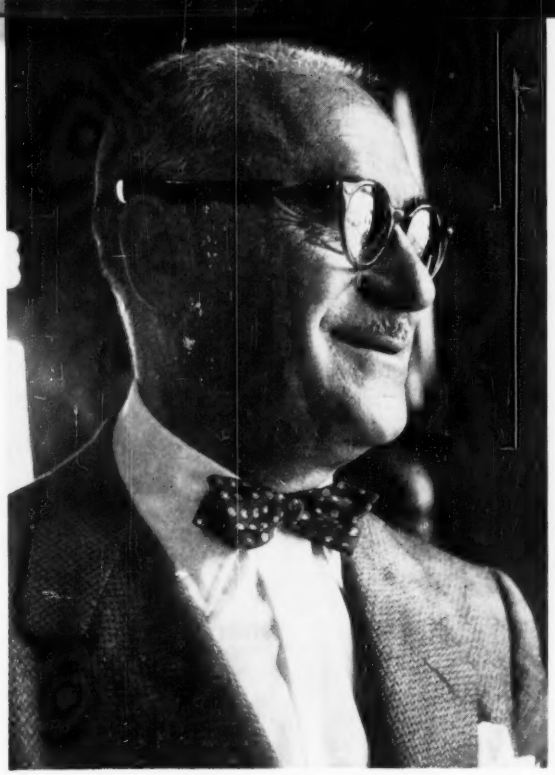
The problem of the textile and apparel industry is to interpret first quarter buying by retailers in practical terms. The danger, if there is any, seems to lie in becoming too optimistic that first quarter new orders will maintain themselves throughout the year. It may be important to remember that some inflation in first quarter 1956 business is only to be expected, from the background of developments in 1955.

Rehabilitation of Rayon's Reputation—The new merchandising program of the American Viscose Company, described elsewhere in this issue, recognizes the fact that the reputation of a fiber has an important influence on its fashion importance and on its sales. Many of the company's "Integrity" fabrics, therefore, will be blends, in which rayon is combined with other fibers, such as silk or wool, which have high prestige values among consumers.

Expanding Market for Acrylic Fur-Type Fabrics—The dice are loaded in favor of the acrylic fibers in "fur fabrics" for the women's coating trade. Everything is in favor of a further expansion in volume, and a substantial one at that. These fabrics have the looks they need in order to gain fashion importance. This is the first season in which coats of this type have been available, even to a small extent, in other than "natural" colors, and the new colors are being well received.

The price of these fabrics puts the finished coats in the general price ranges where fur-trimmed coats used to be important. And, since the decline in the importance of fur-trimmed coats in the past few years has left a big hole in the sales volume of coat departments, the new "fur-fabric" coats are arousing great interest among retailers, who welcome any new item that may help close up this gap.

(Continued on Page 70)



How MAX DOFT Built Princeton Knitting

Princeton today is an acknowledged pace setter in knitted fabrics. Its success is largely credited to Max Doft's 43 years of hard work, fashion intuition and warm integrity

By Jerome Campbell
Editor MODERN TEXTILES MAGAZINE

ONE DAY in the spring of 1913, two serious young men presented themselves at the office of the county clerk in Manhattan. They had decided to go into the knitting business together, they told a functionary in the clerk's office, and they wanted to register the name of their new company as prescribed by law. The clerk studied the papers they had brought with them, hesitated a moment, cleared his throat, and then pointed to a calendar on the wall. "Gentlemen", he said, "don't you realize that today is Friday, May 13? This is no day to start a new business. My advice to you is to go home and come back on Monday."

But the young men, whose names were Max Doft and Simon Teich, were not impressed by the superstitious fears of the county clerk's assistant. They were full of the courage that youth and an awareness of abundant energies and abilities can give. On Monday they told the clerk, they planned to be extremely busy in their new shop turning out the superior knitwear which they expected would in time make them wealthy. At their insistence, the superstitious scribe duly entered the name of their new business, Princeton Knitting Mills, on the records muttering as he did so at the brashness of the young and their lack of respect for the fears of old men.

The shop in which the young partners—Doft was 23 and Teich a few years older—were hard at work during the following week was located at 463 Broome Street in lower Manhattan. It was equipped with three old-fashioned hand knitting machines and four sewing machines. Working capital in the hands of the partners amounted to $350.

Their choice of the elegant name, "Princeton", was in accord, Max Doft now recalls, with the fashion of the times in knitting circles. There were knitwear companies with such names as Yale, Harvard, Columbia and Cornell. Doft, being an ardent admirer of Woodrow Wilson then serving his first year as President, had hit upon Princeton for the name of the new knitting partnership. He had not forgotten that it was from the presidency of Princeton that Wilson had started the political career which brought him to the White House.

Today, 43 years later, the little company with three hand knitting machines on Broome Street has grown to be Princeton Knitting Mills with over 1,000 machines in place in its plants in Waterbury, Conn., and more than 1,000 workers. And during these 43 years Princeton's reputation for fine quality goods and brilliantly successful styling has grown even more than its physical plant: in knitwear, there is no more respected name.

Even if you knew nothing about textiles, and you were to drop into Princeton's office on New York's Seventh Avenue these days, you would soon realize that you were in one of the really supercharged powerhouses of the fashion industry. The steady flow of customers and suppliers' salesmen through the reception room; the switchboard overloaded with calls; the ringing of telephones; the bonging of the autocall—all are symptoms of the high success that is Princeton's.

And your realization that Princeton is riding the top of the wave of prestige and authority in the fashion

world would be confirmed when you examined some of the fabrics in the company's line. Most newsworthy is the new "Mutation" a knitted fur-like pile fabric of Dynel and Orlon which closely resembles mink. This is the fabric that was shown on *Life* Magazine's Dec. 1 cover, and featured in an extended picture story on the inside pages.

Then there is Ollegro, another Dynel-Orlon pile fabric, which in the past few seasons has established itself as a tremendous success. You would be impressed also by D'Orella, the Orlon fleece now widely used as a fabric for women's lighter coats. In lighter fabrics, there is Princeton's Kittenfluff, a brushed nylon which five manufacturers are making up into sleep wear at a rate which requires the company to knit five to six million yards a year. Another Princeton smash hit this year is Feath-or-nyl, a jersey-knit fabric of Orlon-nylon which has the appearance and hand of a fine cashmere. Used by Henry Rosenfeld in dresses, the fabric has piled up a retail sales volume of $4 million in only two months, according to Sam Silverman, Princeton's director of sales, making it, says Silverman, the year's best selling dress.

Doft Pioneered in Knitting Rayon

These are only a few; there are many more. And nearly all of these successful knitted fabrics are made with man-made fibers. So great is the fashion authority of Princeton fabrics, that dress and coat manufacturers compete feverishly for the privilege of being selected to use these cloths in their lines. And retailers, when they advertise garments made with Princeton knitted goods, play up the company's name. They are aware of Princeton's high reputation, a business asset which Max Doft has been more than 40 years abuilding.

Doft, his associates say, is the man who deserves the full credit for Princeton's position in the industry today. On the other hand, he modestly gives most of the credit to his associates, especially to Harry Fleisher, who handles the production end of the business.

After Princeton was organized on that lucky Friday the 13th back in 1913, the new company at first confined itself to turning out wool sweaters of a fairly low-priced and scratchy grade. But in 1917, Max Doft began experimenting with a new and uncertain yarn called "artificial silk." This cellulosic fiber was just beginning to win the interest of forward-looking textile people. It was the primitive ancestor of the textile material which, after decades of improvement and refinement, we know today as rayon.

At that time, fashionable women were wearing long, knitted silk garments known as mandarin coats, or, less elegantly in the trade as silk sweaters. At retail, they sold for upwards of $125 which in those days was a lot more money than it is today. It occurred to young Doft that if Princeton could knit similar garments of this strong new "artificial silk", the company would be able to make fashion history.

Soon Princeton was in production, knitting these popular long torso sweaters of rayon filament yarn which the company first imported from Belgium and Switzerland at $18 a pound. Despite this steep yarn price, Princeton was able to make mandarin coats that looked like the $125 kind, but which sold for only $25.

Another success achieved by Princeton in those early days was its introduction of a piece-dyed knitted dress fabric known as tricollette. This too was made of rayon. These fashion successes emboldened the company at Doft's insistence, to install newer and finer gauge machines. It was Doft's prescient conviction that knit goods as fashion materials had an expanding future.

In the next few years, guided by Doft's unerringly sure instinct for foreseeing important fashion trends, the company began producing with profit knitted sportswear for women. These blouses and jackets fitted into the snowballing trend for women to wear informal clothes more and more, and to spend more time in sports. Garments made with these new Princeton fabrics had never been seen before. They were a tremendous success in the market, bringing to Princeton great prestige and steadily growing financial strength.

Sales Volume Increased Rapidly

With the shrewd sense of doing the right thing at the right time that is the mark of so many successful business men, Doft in those years was quick to take advantage of Princeton's success by a program of rapid expansion. He bought out his partner Simon Teich and began absorbing smaller firms to get as quickly as possible the added capacity he wanted. Meanwhile the company's sales volume climbed. In 1925, it reached $800,000, double the 1924 figure. In 1926, dollar volume broke through one million, up 30% over 1925. In 1928, sales reached $3 million, a year later $4 million.

One of the many mergers with other knitting companies which took place during those years turned out to have enormously favorable significance to Doft and Princeton. This was a rayon knitting plant in Petersburg, Va., and its purchase was important because of a man it brought to Princeton rather than any new machinery or other plant assets. This man was Harry Fleisher, whom Doft describes as a "technical genius". Fleisher and Doft became partners, Fleisher taking charge of production and Doft of styling and marketing. In 1929, the partners converted Princeton into a corporation with Doft as president and Fleisher as secretary-treasurer.

Consolidated Plants in Watertown

By 1930, Princeton had a mill and dyehouse in Brooklyn, and another plant in West New York, N. J., as well as several auxiliary establishments in Manhattan. Realizing that these scattered plants were uneconomic, Doft and Fleisher bought from Belding Hemingway a commodious mill in Watertown, Conn., where they concentrated their knitting and finishing operations. After the consolidation of their plants and attendant reorganization, Princeton's volume resumed its upward march. Today, the company is doing a business in the area of $15 million a year.

But volume figures tell only a part of the Princeton story. Far more important is the wide respect Princeton commands in the field of knit goods and high fashion. The company is known not only for the fashion prestige of its fabrics, but for the high integrity of its dealings. And most of the credit for this unsurpassed reputation must go, his associates insist, to Max Doft.

He is a plain and honest dealer with all who come in contact with him. A sensitive, thoughtful and scholarly man, Doft has all his life insisted on imparting to the daily rough-and-tumble of a highly competitive business the highest standards of civilized conduct. He is a man famous for his humanity in his dealings with his fellow men.

To illustrate this trait, his colleagues tell this story

(Continued on Page 45)

Whitin's New Drawing Frame

Increased output, better sliver among advantages claimed by manufacturer

STAFF PREPARED

WHITIN MACHINE WORKS has brought out a new drawing frame which, the company believes, brings to the drawing process greatly advanced standards and levels of production, quality and operation. Called the "Even-Draft" drawing frame, the Whitin machine is an entirely new textile unit which provides the industry with a machine that operates at speeds ranging from 2½ to 3 times the speed of conventional drawing frames, Whitin states. All fibers from ⅞" to 3" can be processed on it.

Whitin reports that its new drawing frame is a precision-built high speed machine equipped with eight deliveries, each four-delivery section being independently driven. It is designed to operate at 250-300 feet per minute front roll delivery speed, providing up to 300 lbs. per hour net production depending upon the fiber run and the sliver weight.

The drafting element in each delivery uses a four-over-five roll arrangement similar in principle to the draw box used for several years on the Whitin Model J Comber. Removal of waste fibers from the rolls and drafting area is done by air vacuum applied for the first time to a drawing frame. This cleaning mechanism, a new product of Pneumafil Corp., is an integral part of the machine. Weighting is applied by enclosed springs mounted above the roll ends.

The new drawing frame will accommodate up to eight ends of either carded or combed sliver. In tests in mill operation on both kinds of stock, the machine has proven its ability and acceptability for mills processing cotton or spun synthetic fiber and blends up to 3".

Numerous advantages are offered by the new drawing frame, according to Whitin. Some are said to result from the increase in production and the improvement in sliver quality. Others result from the specific design elements. These, the company states, incorporate features not found on conventional drawing frames, or are improvements which reduce operational, maintenance, cleaning and repair costs.

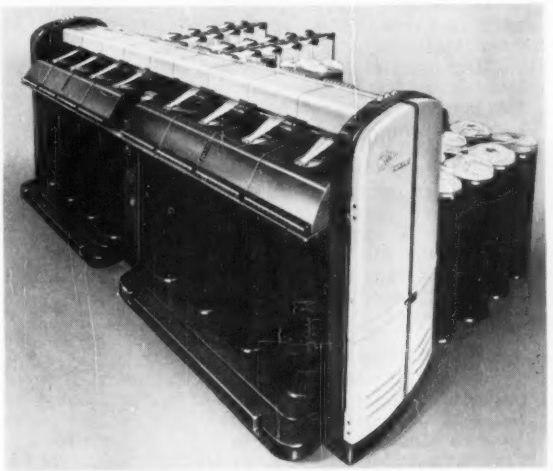
Productionwise, Whitin says, the new machine offers the following advantages: Front roll delivery speeds up to 300 feet per minute compared with the conventional 100-125 feet per minute result in a reduction of 50 to 60% in the number of deliveries. For a mill now running conventional drawing at 100 feet per minute, eight deliveries of "Even-Draft" drawing from the new Whitin machine would replace from 16 to 22, and perhaps more, deliveries of conventional drawing.

Floor space would also be reduced approximately 50 per cent.

Power consumption would be approximately equal to or slightly less for the same poundage.

Labor costs would be proportionably lower, with savings of approximately 50 per cent or more. Not only 50-60 per cent fewer deliveries are required for the same production, but certain duties such as cleaning clearers are eliminated. Creeling and doffing duties will be determined by the can size used and the production speed chosen.

Substantial improvements in sliver quality are possible with the new frame, Whitin declares. Using the new "Even-Draft" frame, the company says, will enable the normal well-run mill to look forward to producing drawing sliver in the range of 15-17% variation (i.e. approximately 2.9% deviation Uster) for carded work and 10-12% variation (i.e. approximately 2.5% deviation Uster) on combed cotton. This range of sliver variation is superior to the quality produced by currently available drawing frames in commercial usage, Whitin believes.



Overall view of Whitin Even-Draft drawing frame with two independent four delivery heads.

The versatility of the new drawing frame is stressed by the manufacturer who points out that it is capable of handling all fibers up to three inches. It is so constructed that it utilizes small rolls where substantial weight must be supported and lapping prevented. The nuisance of having to change front roll diameters to accommodate stock with different staple length is eliminated, Whitin declares.

According to the manufacturer, the "Even-Draft" drawing frame has extremely heavy structural members, massive roll stands, large diameter rolls, precision gearing, and many anti-friction bearings. It is machined to far closer tolerances than are generally considered necessary on standard drawing frames.

Heavy duty anti-friction bearings are extensively used. All of the top rolls in the drafting element are so equipped as are the front and second bottom lines. Roller bearings are provided also on the draft gear

(Continued on Page 66)

MILL TEST PROCEDURES
A New Series on Quality Control

By Robert L. Enrick*

Mill Testing for Opening and Picking

First of a Series

Introduction

The test procedures in this series are the result of many years of practical experience in setting up quality control programs in a large and diversified number of mills, and are those which have been found most important for the effective operation of a quality control laboratory in the average spinning and weaving mill.

Collection of Tests

Each test is presented individually in a form which permits it to be readily clipped from the page and to be collected in a loose-leaf three-ring type notebook and thus serve as a Mill Testing Manual for the average mill. Use of a loose-leaf book is desirable, since it often becomes necessary to revise test procedures to conform with changing mill conditions or with progress in testing. Then an old procedure sheet is best replaced with the revised new sheet.

A collection of test procedures would be rather lifeless if it just contained the "know how" of the work. Therefore, it was found desirable to also include the "know why," by outlining the purpose of each test, by showing recommended sampling procedures, and by discussing briefly the evaluation of the test results.

Correlation with Prior Series

The overall control program, within which the procedures under the current series would function has been set forth in the prior series on MODERN MILL CONTROLS.* Further, the statistical summary and evaluation of the test data are outlined in another prior series on QUALITY CONTROL THROUGH STATISTICAL METHODS.* Thus the present series, together with these two prior series, forms a rounded set of methods, techniques and procedures which, with individual modifications, should serve the overall mill objectives of lowered costs, increased production, and improved quality in today's competitive economy.

*Now available in bound form through this Magazine.

Many industrial plants find it advantageous to set up written testing instructions, for use in their routine quality control program. This assures standardization of procedures within a plant and tends to minimize the effect of personal differences in the performance of tests. Such standardization is even more important where there are several plants and it is desired to compare the test results on a common basis.

These principles, proven in industry in general, have been found equally valid for textile mills. Even in relatively small mills, where certain tests are performed by only one person, written test procedures will be of great value. For when new personnel is to be trained, or shifts in duties occur, such written procedures save much time that would otherwise be spent in personal instruction. Also, if special points and cautions on certain tests are laid down in writing, they are less likely to be overlooked, thereby minimizing the possibility of faulty or unsafe practices.

This new series of articles is designed to serve those mills who do not now have written test procedures. Those who already have such write-ups, may nevertheless find tests here which have not been used in the past, and which may be deemed worthy of adoption. Also, new short-cuts and simplifications may be found, which will save testing time and costs.

Acknowledgment

Much of the material used in this series is derived from experience in preparing standard test procedures for textile mills, during the author's five years' association with Werner Textile Consultants. As in the prior two series, the author is indebted to this firm for the co-operation in preparing this series and in particular for many testing forms and other illustrative material contributed.

IN THIS first instalment, test procedures for Opening and Picking are presented, as they would apply to cotton and cut-staple synthetic processing, including:

1. Opening Line Feeder Adjustments Test.
2. Opening and Picking Feeding Percentage Test.
3. Picker Lap Weighing Check.

*Institute of Textile Technology.
Formerly with Werner Textile Consultants.

The purpose, sampling and testing procedure, and test results evaluation are furnished for each test, suitable for use in most mills. Occasionally, it may be desirable to supplement such procedures with further detail. An example of this is given in Fig. 1, "Feeder Adjustments", showing the particular settings which may require checking; in particular the settings of the combing rolls, lifting aprons, and doffing rolls.

(Continued on Page 37)

Sharp or dull shades . . .

NATIONAL CARBANTHRENE® BLACK BROWN VA PASTE

Here's a versatile National anthraquinone vat that is particularly useful for shading subdued deep tones and as a shading color or major component in deep browns.

In heavy shades on cotton or viscose, National Carbanthrene Black Brown VA Paste has maximum (8) light fastness (In medium shades, it rates excellent; in light shades, very good!). In addition to excellent wash fastness this National Dye rates well up the scale in a long list of tests as shown in our Bulletin #429. Recommended also for materials that are to be resin finished for crease resistance.

Get in touch with our nearest office for shade card, working sample, price and delivery on this useful dye.

NATIONAL®

vat dyes

LIGHT FAST... WASH FAST... FOR THE-LIFE-OF-THE-FABRIC

Allied Chemical

NATIONAL ANILINE DIVISION ALLIED CHEMICAL & DYE CORPORATION

40 Rector St. New York 6, N. Y. • Boston Providence Philadelphia Chicago San Francisco Portland, Ore. Greensboro Charlotte Richmond Atlanta Los Angeles Columbus, Ga. New Orleans Chattanooga Toronto

Mill Test Procedures

(Continued from Page 34)

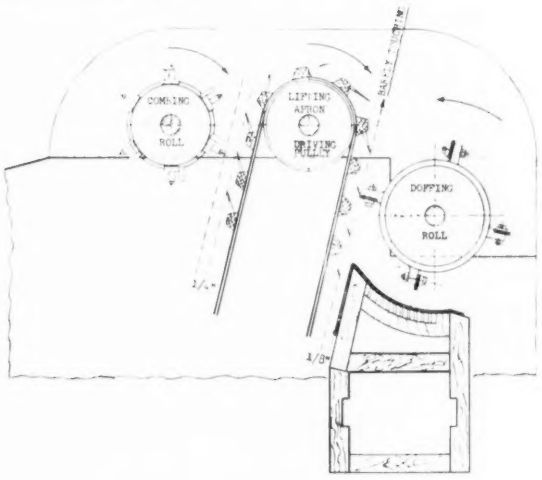


Fig. 1

Opening Line Feeder Adjustments, showing settings of combing roll to lifting apron and doffing roll to lifting apron.

Diagram through courtesy Werner Textile Consultants

Convenient testing forms may be used, such as the "Blending Feeder Speed and Delivery Test" sheet in Fig. 2, to facilitate recording of actual test results. The speed tests shown on this form are not discussed here, since they will be included in a general speed testing procedure for all departments within a mill, to be furnished later.

On the pickers, it is also desirable to have a test for weight variation within the picker lap. This test involves primarily statistical calculations of variability, which have been previously presented in the series on QUALITY CONTROL THROUGH STATISTICAL METHODS, using a typical picker lap; and are therefore not repeated here.

Frequency of Testing

A question is often raised concerning how often a certain type of test should be performed. No hard and fast answer can be given, as much depends upon the condition of equipment and the degree of quality control desired. However, the following general rules may be helpful for Opening and Picking tests:

1. Opening Line Feeder Adjustment Tests and Opening and Picking Feeding Percentage Tests are usually performed once every ten weeks, or at a raw stock change.
2. Picker Lap Weighing Checks should be made twice a week, spaced at random intervals, so as to avoid pre-knowledge of the operator to be tested.
3. Picker Lap Weight Variation is usually checked once a week where a Saco-Lowell Lap Meter is used. Where newer electronic devices are available, such as the Uster Tester with automatic integrator, it is usually practical to perform the test daily or at least twice per week. Often it may be found desirable to perform tests on both types of equipment.
4. Speed tests concerned with production rates on pickers are desirable once every five weeks, while speed tests concerned primarily with quality may be staggered to once every ten weeks. Usually, the effect of a somewhat slower opening and picking speed is not very marked on either improved or poorer quality; but slower production speeds have an immediate effect on mill costs and may also lead to "unbalanced" conditions, whereby the output of one department becomes insufficient to keep the succeeding departments operating at optimum capacity.

OPENING LINE FEEDER ADJUSTMENTS

Purpose

Good feeding and blending of stock requires optimum adjustment and uniform operation of feeders in the opening line. The test here is designed to assure that these conditions are actually attained.

Testing Equipment

Stop watch. Scale, capacity 5 pounds, sensitivity 1 ounce. Large envelopes, capable of holding about 5 pounds of loose cotton from each feeder.

Procedure

For the short one-minute duration of the test, inactivate whatever stop or evener motions that govern the operation of the feeders. This will assure constant and full rate delivery from each feeder during the test. Then:

1. Stop the conveyor belt served by the feeders.
2. Collect the stock delivered by each feeder for a

Fig. 2

BLENDING FEEDER SPEED AND DELIVERY TEST

LINE NO. 1

		Feeder No. 1	2	3	4
Speeds	Lifting Apron R.P.M.				
	Combing Roll R.P.M.				
	Doffer R.P.M.				
Production	Weight of Stock in _____ Minutes (lbs.)				
	Production Rate (lbs./min.)				

LINE NO. 2

		Feeder No. 1	2	3	4
Speeds	Lifting Apron R.P.M.				
	Combing Roll R.P.M.				
	Doffer R.P.M.				
Production	Weight of Stock in _____ Minutes (lbs.)				
	Production Rate (lbs./Min.)				

LINE NO. 3

		Feeder No. 1	2	3	4
Speeds	Lifting Apron R.P.M.				
	Combing Roll R.P.M.				
	Doffer R.P.M.				
Production	Weight of Stock in _____ Minutes (lbs.)				
	Production Rate (lbs./Min.)				

OFF-STANDARD RECORD

Line No.	Feeder No.	1st Check Item	1st Check R.P.M.	1st Report (date)	2nd Check R.P.M.	On Std. (date)

Note: Place red pencil X besides all off standard results.

Date:

Tested by:

Form through courtesy Werner Textile Consultants

period of 60 seconds. (Start collecting with the feeder on the far end of the line.)
3. Place the stock from each feeder into the properly marked bag.
4. Quickly re-activate the conveyor belt and stop-or-evener motions, so as to put the line back into proper operation.

Evaluation

By weighing and determining the net ounces in each bag or envelope, the delivery rate of the feeder is found in terms of ounces per 60 seconds.

Any individual feeder which deviates by more than 8% from the standard ounces or by more than 5% from the general average of all the feeders in the line, is in need of checking and re-adjustment.

OPENING AND PICKING FEEDING PERCENTAGE

Purpose

Where a mill has the slowest possible production rates in opening and picking, it achieves maximum removal of trash, leaf and shorter fibers. Yet certain sections of the equipment must run faster than succeeding sections, so that a reserve of stock can be built up in hoppers, reserve boxes, and other evening devices. The success of the mill in accomplishing this is measured by the feeding percentage, which represents the ratio of running time of one section to the succeeding section.

Testing Equipment

One two-needle stop watch; or two single needle watches.

Procedure

Prepare for the test by advising personnel involved to keep hoppers at normal operating levels. Designate one section to be tested as "A" and the succeeding section as "B." Then, at a time when both sections are running, start the stop watch needles, and proceed as follows:

1. Whenever "A" stops, stop the needle. When "A" resumes running, start the needle again without resetting to zero.
2. Continue as in Step 1 throughout the test. This will yield the total running time of "A."
3. Time "B" in the same manner, using the second stop watch needle. In most opening lines, however, "B" is usually set to run continuously.
4. When 30 minutes running time have elapsed for "B", stop the test.

Evaluation

Determine the Feeding Percentage from the Formula:

Feeding % = (Run Time Minutes of "A") × 100/30

Here 30 represents the run time minutes of "B" and 100 converts the ratio to a percentage. Optimum feeding percentage is usually between 85 and 95%. A lower percentage indicates less than optimum opening rates, while a higher percentage indicates that stock in reserve hoppers is inadequate for uniform lap formation.

LAP WEIGHT CHECK

Purpose

In order to assure that only laps of proper weight reach the card room, the picker tenders are usually required to segregate any off-standard laps. Occasional spot checks should be made to assure proper segregation of such laps, for re-processing.

Equipment

Picker room lap scale.

Preparation

It is essential that the mill establish a standard weight for the lap stick, and then bring all lap sticks to this weight. The lap stick will thus represent a constant tare weight. Then, a counter-weight may be placed on the lap-scale, so as to automatically deduct the tare from the scale weight. The scale then reads directly in net weight.

Sampling

This test should be performed at un-announced intervals, in such a way that the picker tender will not be able to anticipate the tester's arrival.

Procedure

1. From the area in which the good laps are stored by the tender, select at random 10 laps.
2. Preferably select these ten from the batch that has come off the picker within the last one or two hours.
3. Weigh each lap to the nearest ounce and record.
4. Note any laps heavier or lighter than the allowable tolerance established by the mill.

Evaluation

Obtain the percent of laps outside tolerance. Whenever this percentage exceeds the limit established by mill supervision, prepare a report of the off-standard condition found.

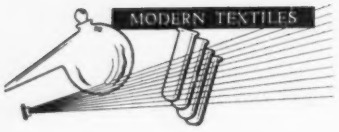
Heineman Closing Chicago Plant

Oscar Heineman Corp., the Chicago throwing firm founded 62 years ago, will close its Chicago plant permanently within the next few months and transfer all operations to its plant in Concord, N. C. According to president, Donald G. Brewster, the move is made necessary because there is no longer sufficient throwing business available in the middle west to make operation profitable.

Heineman will continue to maintain a Chicago sales office in its present quarters under the direction of Mr. Brewster who will spend a portion of his time there. Next year a sales office will be opened in the Merchandise Mart. Some Heineman equipment will be scrapped, other portions stored, and some installed in the Concord plant.

Quality Control Conference Date Changed to February 13-15

The date of the Sixth Annual Textile Quality Control Conference to be held at the Institute of Textile Technology, Charlottesville, Va., has been changed from February 9-11, 1956 to February 13-15, 1956, to avoid conflict with the Middle Atlantic Regional Conference of the American Society for Quality Control, scheduled February 10-11, 1956, in Washington, D. C.



Report from EUROPE

By Guillaume Lambert

Bright Rayon Recovery—*MILAN:* The Italian rayon industry, second in size only to Germany's in Europe, closed out the year 1955 with output well up to production capacity. Not since 1951—when over 135 thousand metric tons of rayon filament yarn and rayon staple were turned out—have the Italian mills been in a position to use most of their vast, modernized equipment. And the outlook, going into 1956 is equally bright.

Output of Newer Fibers Rising—As is the case throughout Europe, a healthy rayon industry is needed to insure steady expansion and research in the true man-made fibers. Last year, Italian rayon makers were able to boost production of the man-mades some eight times over the 1951 level. In that year, less than one thousand tons were produced, and that largely nylon. Unofficially figures for 1955 place man-made fiber production in Italy at around eight thousand metric tons, largely nylon and Merinova.

The Role of "Movil"—Moving swiftly ahead in the true man-made fiber category was "Movil," a polyvinyl fiber produced by the Montecatini affiliate, Polymer. Early last year, it was thought that Polymer would not be able to turn out important commercial quantities of "Movil" until the beginning of 1956. As it turned out, sizeable volume was produced starting in the third quarter. Intensive retailing of mixed and pure "Movil" garments is now underway.

Good for What Ails You—Much of the "Movil" publicity states that the new fiber is "warmer than wool". Going even further than Americans in promoting new fibers, "Movil" sponsors claim therapeutic qualities for it. As a Reumotex-Saronno ad recently put it, "according to tests undertaken in clinics and hospitals and at the Rome Rheumatological Center, it has been found that the application of Reumovil cloth to the skin, perhaps due to the electric charge produced by friction, has resulted in prompt relief of muscular and arthritic pains" as well as other aches requiring warmth treatment. "Movil," consequently, is moving well in the knit underwear field for men, women and children.

Silk Holding Its Own—Italian silk weavers, who have successfully converted to quality rayon and man-made fiber production, last year consumed about as much natural silk as they did in 1954. But with the 1955 output generally on the rise, this meant a smaller percentage of silk being consumed. And it now seems probable that weavers, mostly located in the beautiful Lake Como region in Northern Italy, are in for some conversion—if silk producers don't bring commercial standards up a bit higher.

Silk output in Italy is about 30 per cent below the 1947 level although there was no further deterioration in 1955 from the 1954 output. However, at a recent meeting, at Treviso, of the Italian Association of Silkworm Producers, the trade agreed that higher yields must be achieved in order that Japanese competition can be met. The Japanese were said to be getting 20 per cent higher yield from their silkworms due to better treatment of worms and eggs. It would take at least a year, however, to change Italian standards, the trade felt.

Some Pure Silks Brisk—Due mainly to continued intense demand from the United States, pure silk fabrics for ties and "style" garments (silk shantungs for dresses and men's suits, for instance), did quite well last year. This is not the kind of volume market the silk industry would like to depend on, however, "classics" such as scarves and underwear generally being preferred. But it would seem that the trend will continue toward specialized pure silk items and more and more silk mixtures—unless a closer replica of the Japanese silkworm can soon be produced.

DYEING and FINISHING Section

BLEACHING
PRINTING
SPECIAL
PROCESSING

New!

SOLOPHENYL YELLOW AUF

For Important Spring and Summer Shades with Outstanding Light Fastness

Use this new direct yellow in combinations with other Solophenyls to produce such fashion shades as Mimosa Yellow, Aloha Gold, Golden Citron, Yellow Plum, Lime Freeze, and Relish Green on cellulosic fibres. It is highly recommended for dress goods blends in which acetate or nylon must be reserved or cross-dyed. Wool and silk are stained only slightly. Resin finishes have little effect on fastness or shade.

Solophenyl Yellow AUF offers moderate resistance to washing which is improved by after-treating with Gycofix 67. It draws slowly, exhausts well and dyes level.

Samples are available and Geigy will be glad to suggest formulations for yellow and green shades for Spring and Summer on your fabrics.

"Solophenyl" and "Gycofix" are Geigy registered trademarks.

GEIGY DYESTUFFS
DIVISION OF GEIGY CHEMICAL CORPORATION
89-91 BARCLAY STREET, NEW YORK 8, NEW YORK

Geigy

dyestuff makers since 1859

BRANCH OFFICES: NEW ENGLAND: NEWTON UPPER FALLS, MASS. • CHARLOTTE, N. C. • CHICAGO • LOS ANGELES
PHILADELPHIA • PORTLAND, ORE. • TORONTO • IN GREAT BRITAIN: The Geigy Co., Ltd., Manchester

here's how to get

BETTER COLOR MIXING

These steps will save time and dyestuffs and give good prints

By Technicus

THE COLOR-MIXER prepares print pastes for printers by engraved copper roller, silk screen or hand block. The work calls for much skill in judging the merits of various thickenings for different printing processes as well as a wide knowledge of many types of dyestuffs.

The art of color-mixing is in many respects similar to that of dyeing from the point of view of the preparation of dyestuff solutions and the actual knowledge of dyestuffs involved. On the other hand, the color-mixer has no control over the actual process of color application and fixation which takes place at different stages in the sequence of printing operations.

The essential operation in color-mixing is, in fact, the thickening of dyestuff solutions or dispersions in such a manner that the prepared colors can be applied by any of the aforementioned processes without spreading the color beyond the bounds of the engraved—silk screen stencil—or hand block design.

The color-mixer himself usually is a trained man working under a foreman color-mixer, who, in turn, receives his instructions from the chemist-colorist.

Planning

In the first place the number of machines, screen printing or hand-block printing tables governs the general lay-out of work for the color-shop staff. Secondly, in the large shop the plan of work may follow the lines of "styles" such as vats—azoics—discharges—urea process colors—cellulose acetate colors, etc., and a color-mixer may have charge of one or more of these groups according to the number of machines or tables operating on a particular style.

The first consideration then, at the beginning of the day, is to review the requirements of the particular group of machines, styles, etc. involved. This, of course, necessitates record-keeping and this is generally done by the foreman who enters in a book or card index (which is better) the patterns, number of pieces and all relevant particulars. From the color-shop records the work is distributed to each color-mixer who proceeds with his helper to get on with the job.

Color-mixer's Helper. This operative's duty is to see that a good supply of color receptacles (tubs, galvanized iron tins, stainless steel or copper drums, etc., all with suitable handles) are clean and ready to hand and also that straining cloths and stirring paddles, ladles, etc., are convenient.

Generally, the helper measures out the quantity of thickening required for a particular batch of print paste, while the color-mixer weighs out and dissolves or otherwise prepares the dyestuff for addition to the thickening. This done, the helper stirs the "mixing" thoroughly and strains it through one or more fine straining cloths or, perhaps, a straining machine to free the color from lumps of thickening and particles of grit, etc. This procedure is repeated for each color with various refinements until a complete batch or more of print paste has been prepared for a particular printing machine.

As a general rule the prepared print pastes in their containers are arranged in batches and covered with lids or straining cloths to prevent any foreign matter in the form of droppings from roofs, beams or girders getting into the made-up colors. It is a good plan to mark the designation of the color on top of the straining cloth covering the tub or other receptacle, so that printers' helpers who come into the color-shop for the print pastes can see at a glance the particular colors they require. Also every printing machine or set of screen tables, etc., should have a special spot on the color-shop floor on which their print pastes are gathered. This makes for efficiency and higher production in the printing shops, not to mention smoother working relationships all round.

Equipment

Copper-jacketed Pans and Mixing Equipment. Mixing, measuring and weighing are the three phases for which color-shop equipment must be provided. The mixing equipment usually consists of double-jacketed copper pans through the jackets of which steam and water may be passed alternately according to whether the thickenings for the print pastes are to be cooked or cooled. There is a range of sizes which may vary from 10 gallons to 100 gallons, the larger sizes being provided with motor driven planetary stirrers which ensure thorough mixing of the contents at all stages of processing.

The "Votator" is replacing this type of equipment in U. S. practice and in this machine the paste or thickening is cooked and cooled in a fraction of the time required in a copper-jacketed pan. The principle in the latter case is to use heated revolving horizontal cylinders through which the mixture which is being cooked is passed in continuous contact with a clean heating surface. The main idea is that of continuous cooking of small quantities of thickening rather than attempting to heat and cook a large mass of comparatively static "paste". Machines of this type are made to deliver up to 3 to 5 gallons cooked and cooled thickening per minute.

Color Containers. These may range in size from a few pints to twenty gallons. Larger sizes are inconvenient to handle both in the color-shop and at the printing machines or tables. As already indicated the materials from which these are made may range from stainless steel to galvanized drums, always bear-

(Continued on Page 55)

First Quality Printing Around the Clock...

at Riegel Textile Corporation

"All day, any day, we can get top quality printing results with our two Butterworth Printing Machines," states an official of the Riegel Textile Corporation's Ware Shoals (S. C.) Division.

The heavy cast-iron frames of the Butterworth Printing Machine assure less vibration. Fibre fitting gears give quiet operation. There's long life in the stainless steel color pans . . . easy control through motor-driven oscillating motion for doctor blades . . . and flexibility and variety in the multiple patterns and small figure designs, with up to 14 color shades, which are registered accurately and easily. Nylon-bristled furnisher rolls assure evenness of color, cleanliness and long life.

For true register . . . quick pattern change . . . smooth, uninterrupted production . . . and low maintenance costs, let a Butterworth engineer give you details on Butterworth Printing Machines.

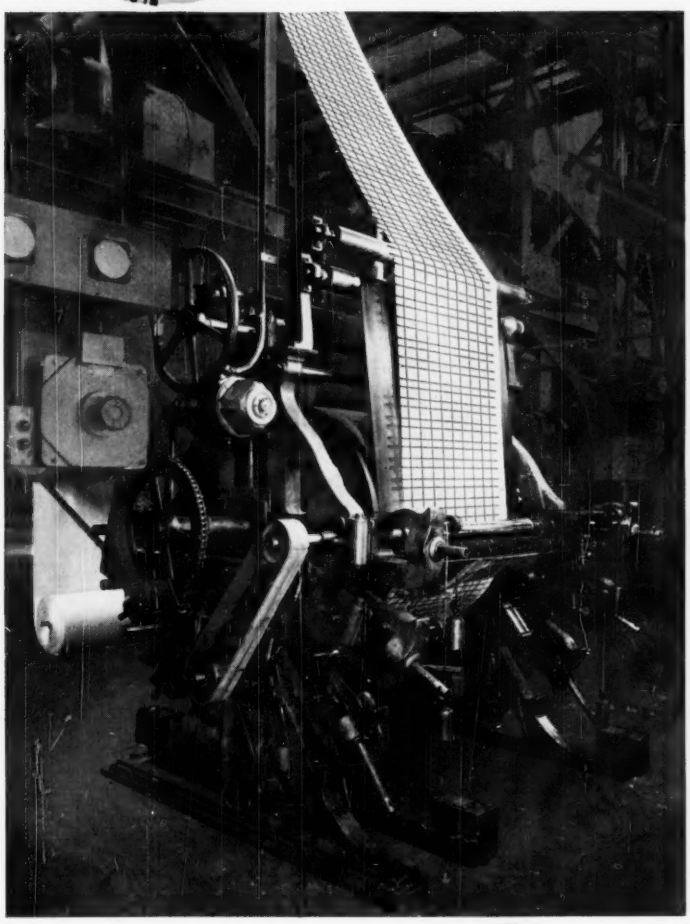
H. W. BUTTERWORTH & SONS COMPANY

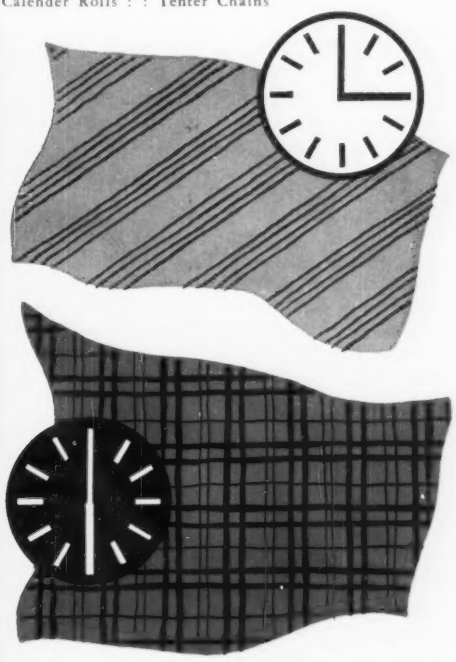
Bethayres, Pennsylvania

1211 Johnston Bldg., Charlotte, N. C.
187 Westminster St., Providence, R. I.

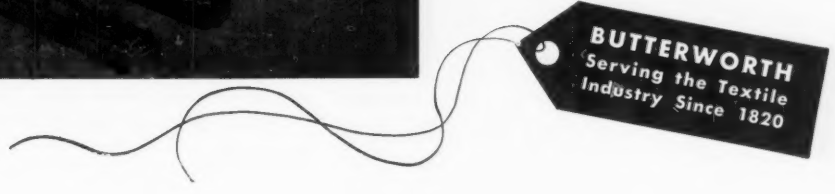
Representatives in Principal Cities of the World

Machines for Bleaching, Boiling-Out, Dyeing, Mercerizing, Finishing & Embossing : : Pot Spinning Machines for Synthetic Fibers : : Calender Rolls : : Tenter Chains





One of the two new Butterworth Printing Machines at Riegel Textile Corporation, Ware Shoals Division, Ware Shoals, S. C. Machines are equipped for high speed operation, and print all of the mill's lightweight broadcloth. Material here being printed is a heavy poplin with multiple stripes.



KNITTING FLUFLON SOCKS?

follow these pointers

STAFF PREPARED

DURING RECENT months "stretch" yarns have been assuming a more important role in the manufacturing programs of knitting mills. There are a number of "false twist" methods available to the mills who are interested in obtaining the proper licenses. Basic know-how on these methods is provided by the licensor.

However, in practice this technical knowledge naturally undergoes a refining process, and it is our objective to review these manufacturing methods from time to time. In this report, we shall present the latest processing information available on Marionette Mill's "Fluflon" stretch yarns.

In knitting these yarns, it is very important to obtain as long a stitch as possible. The goods should be knitted loosely enough to produce a sleazy fabric. If you are producing half-hose for men or children, your greige should be long enough to fit loosely on a board one size larger than the *largest* size you wish the finished sock to be able to stretch. The tension on the yarn while knitting should be only just enough to give you a controlled supply.

Greige socks should be looped as soon as possible. The job will be a whole lot easier for your looper if you cut the lag period to an absolute minimum. The reason for this is that the socks are at the largest size when they come off the machine, but begin to contract as they lie around.

After looping, the socks should be shrunk. There are two ways of doing this:

1. Steam them in a steam tumbler for five minutes. Turn off the steam and let the socks tumble until dry.
2. Socks may be immersed in either cool or warm water. (Don't let the temperature of the water exceed 140 degrees F.!) After wetting, place the socks in a dryer and tumble them until dry, at about 180 degrees F. This method will give you the maximum shrinkage or relaxation of "Fluflon." Both the heavy duty home-type hot air tumbler dryer and the large commercial types used in laundries are ideally suited for this purpose.

Make certain that the socks are completely dry before pre-boarding. Pre-board them on as small a size board as possible at about 230 degrees F. After shrinking, the socks will be very small. Do not stretch out the socks to fit a large board. You will get much better results on the small board. As a matter of fact, some mills are eliminating pre-boarding because they feel this procedure does not sufficiently press out all of the wrinkles that occur in dyeing.

When "Fluflon" yarns are of nylon, they should be dyed at 180 degrees F. Because of "Fluflon's" uniformity throughout its entire length, you should obtain dyed socks that are completely free of streaks.

All the processing information, except for dyeing, also pertains to "Fluflon" of Dacron polyester fiber. The Dacron should be boiled for five to ten minutes. This does not aid the dyeing particularly, but is a means of obtaining the greatest possible shrinkage of this type of "Fluflon".

In post-boarding, use a board one-half size smaller than the smallest size you wish the sock to fit. For instance, if you are making a sock for size 10-13, you must use a 9½ board.

Decade of Textile Prosperity?

J. C. Cowan, Jr., vice chairman of the board of Burlington Industries, recently told members of the Greater Charlotte Textile Club that the next 10 years may spell the end of over-production in the textile industry.

"The growth of our economy may be rapidly catching up with our industry capacity," the Greensboro textile executive said. "The potential demand for textile products during the next 10 years may well outrun the visible supplies. The next decade could see the industry enjoying a fair and reasonable return on investment, something it has not achieved in the past."

One of the earliest successful textile mills in the United States, the Slater Mill in Pawtucket, R. I., has been restored and reopened as a textile museum. Shown at left is a replica of one of the original carding machines in the mill which was built in 1793 by Samuel Slater and his partners. The mill was opened as a museum during July and remained open to visitors until Oct. 1.

FORTISAN-36

Output Stepped Up

Celanese puts new Rome, Ga., plant in production

Production was started last month on a new industrial fiber, Fortisan-36, at the Rome, Ga., plant of Celanese Corp. of America. Harold Blancke, Celanese president, told guests at ceremonies marking the occasion that the new fiber had properties of great strength, low elongation and dimensional stability. These properties, he said, indicated a bright future for the new fiber in such industrial applications as V-belts, transmission belting, high pressure hose, conveyor belts, truck tires, plastic laminates, oil hose and tarpaulins.

Mr. Blancke said that Fortisan-36 had been tried by industry and had been proved to be important wherever high strength and the maintenance of dimension is essential; where strength without bulk or weight is a consideration; and where its melting property is of interest. He said Fortisan-36 also provided a good bond with both natural and synthetic rubber, and requires no further processing to remove stretch.

Developed especially for industrial applications where heavy deniers are required, Fortisan-36 will be available initially in 800 and 1600 denier continuous filament at $1.45 a pound. Other sizes in the heavy denier ranges will be offered later. Although chemically akin to Fortisan, the regenerated cellulose yarn introduced by Celanese in 1940, Fortisan-36 is made by entirely new and different equipment.

Fortisan-36 demonstrates its great strength. At the ceremonies opening the Rome plant, a slender rope of Fortisan-36, only 5/16ths of an inch in diameter, was used to tow this giant transformer on a flat car. Total weight of the load pulled by the Fortisan-36 rope was 90 tons.

Covering 60,000 square feet of floor space, the Fortisan-36 equipment is installed on three different floor levels to take advantage of gravity flow. The installation is so designed that raw materials can be charged into the system on the third floor and, after mixing, filtration, spinning and saponification, emerge on the first floor as a finished product.

Maximum use is made of automation and instrumentation in the Fortisan-36 process. All instruments and controls are located on a graphic panel which shows, at a glance, how every part of the process is functioning. From his location at this panel, the operator can start or stop any part of the process except the spinning machines. He can also adjust the temperature, flows and concentrations of the more than 2,500,000 gallons of process fluids which circulate through the system daily.

Max Doft *(Continued from Page 32)*

—one among many. A few years ago when Princeton Orlon fleece fabrics had just emerged from the developmental stage to become a smash hit in the market and were in enormous demand by established big name cutters, Doft was in Los Angeles. Two young men came to him and asked for regular shipments of this wanted cloth. They had just established their own business, and they felt that they could do well with Princeton's new fabric.

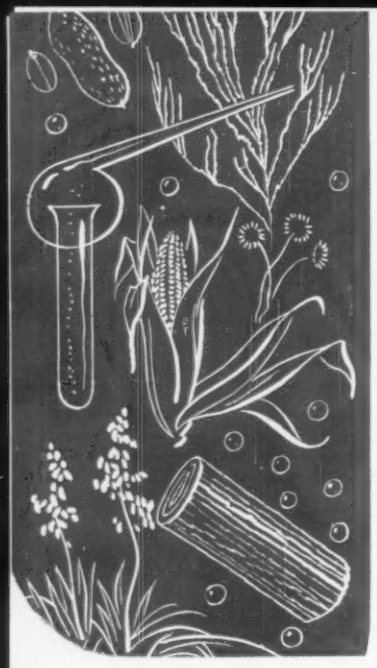
Doft visited their shop and found it consisted of a few sewing machines installed in a vacant store. These young men had never been in business before. They had no merchandise; they had no orders, and their credit rating was zero. They were unknown to retail buyers. By ordinarily prudent business standards they were a poor risk.

But Doft talked to them and was impressed by their energy and their ambition. He also decided that they were honest. Remembering how he had started out in business with a few old knitting machines, and a capital of $350, he decided that these young men were worth taking a risk. He gave them the fabric they needed on a long-term credit. In a few years, he had the satisfaction of seeing them well established with a sound credit rating, good retail contacts and an expanding business.

There are other evidences of Max Doft's humanity. Among these are his open-handed generosity both of his money and his energies on behalf of numerous charities and community welfare interests. The major objects of his bountiful giving are the United Jewish Appeal, the Zionist cause, and the researches into cancer carried on by Dr. Emanuel Revici with the support of the recently organized Cancer Research and Hospital Foundation. Dr. Revici's work has for Doft a special interest. He sees in Revici's use of synthetic lipids in cancer therapy an opportunity to lessen the malignity of this disease in many cases, and possibly in time reduce greatly the number of cancer deaths.

Another element of Doft's humanity is his lifelong, wholehearted devotion to good music. As a young emigrant door-to-door peddler in Boston, he acquired an enthusiasm for music when he was taken by friends to the concerts of the Boston Symphony Society. This enthusiasm has deepened with the years. He has supported musical causes generously with his earnings in the knitting business and he can count among his friends many eminent musicians.

Today in his 65th year, Doft continues to direct with a firm hand the successful course of the company he founded. His associates are still amazed by his tremendous capacity for work when he feels that there are tasks that merit his personal intervention. But Doft is not a slave of work; he is not afraid to turn over responsibilities to younger associates. In the future, he looks forward to giving more of his time to the charitable causes which he feels are as equally meaningful to his life as the continued success of his company. ■



Eleventh of a Series

MAN-MADE FIBERS DATA SHEETS

by Paul-A. Koch

Polyacrylonitrile Fibers

1. Definition, Product Names

According to H. REIN[5] the group of polyacrylonitrile fibers consists of those synthetic fibers which are produced from pure polyacrylonitrile or from co-polymers containing at least 85% acrylonitrile.

[Fibers made from co-polymers of acrylonitrile and containing more than 15% of other vinyl compounds are not considered here. They have been dealt with in the previous Data Sheet "Co-Polymer Fibers".]

Acrilan [Reg. U. S. Pat. Office] (at first *Chemstrand acrylic fiber*)[29, 60]—staple fiber of a co-polymer of at least 85% acrylonitrile (and probably not more than 15% vinyl acetate[57, 87] or vinyl pyridine,[83] resp. with a few percent of other vinyl compounds), produced by Chemstrand Corp., Decatur, Ala., which is a joint foundation of American Viscose Corp. and Monsanto Chemical Corp. Experimentally produced since 1950, large scale production since the fall of 1952; improved type manufactured since 1954.[74, 75]

Creslan (see X-54).

Crylor (at first *Fibre D*) continuous filament yarn and staple fiber of polyacrylonitrile, of the Société Rhodiaceta SA., Lyon, France, produced since 1952.

Dolan-acryl (at first *KSF-Kelheim*), staple fiber of polyacrylonitrile, produced in the form of tow or spun yarn (up to Nm 200/1)—also spun-dyed in 48 colors—of the Süddeutsche Zellwolle A.G., Kelheim/Donau, Germany, produced since 1952 by their own process.

Dralon (at first *Bayer-acryl-Faser*)—staple fiber of polyacrylonitrile—also spun-dyed—of the Farbenfabriken Bayer A.G., Dormagen, Niederrhein, Germany, produced since 1953.

M-24—experimentally produced fibers of polyacrylonitrile of the Tennessee Eastman Corp., Kingsport, Tenn.

Nitrilon[78]—experimentally produced fibers of polyacrylonitrile according to a process of the Textile Institute Kirow, Leningrad, U.S.S.R.

No. 53—experimentally produced fibers of polyacrylonitrile of the N. V. Kunstzijdespinnerij Nyma, Nijmegen, Holland.

Orlon [Reg. U. S. Pat. Office] (at first *Fiber A*)[2, 5, 6, 12]—fibers of polyacrylonitrile of the E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., experimentally since 1942,[104] and in large scale production since 1950 at the May plant, Camden, S. C., according to the dry spinning process, with the following two types:

Orlon 81, continuous filament yarn[16], highly-stretched, with low affinity for dyes;

Orlon 42 (formerly *Orlon 41* which was replaced at the end of 1953 by the improved type 42), staple fiber, not as highly stretched and strong as type 81, but easier to dye.

PAN endlos, PAN-Faser—fibers of polyacrylonitrile by the dry spinning process,[79] experimentally produced since 1943[1, 8] by the former I. G. Farbenindustrie A.G., Wolfen, Kr. Bitterfeld, now made by the Cassella Farbwerke Mainkur A.G., Frankfurt/Main-Fechenheim, Germany.

Redon (at first *PK II*)—staple fiber of polyacrylonitrile of the Phrix G.m.b.H., Hamburg, Germany, on the market since 1952.

Sinsen[99]—experimentally produced Japanese polyacrylonitrile fibers, partially hydrolized.

X-51, *X-51 staple* [Reg. U. S. Pat. Office][28, 29]—fibers produced from a copolymer of acrylonitrile with a few percent of other acrylo compounds (acryloamide?[93]) or partially hydrolized[93] according to a wet spinning process by the American Cyanamid Co., Stamford, Conn., since 1952 in pilot quantities.

X-54 (now named *Creslan*)—staple fiber of a co-polymer of acrylonitrile of the American Cyanamid Co., Stamford, Conn.

Wolycrylon[79, 88]—staple fiber produced from polyacrylonitrile by a wet spinning process by the VEB Film-u.Chemiefaserwerk Agfa Wolfen, Wolfen, Germany.

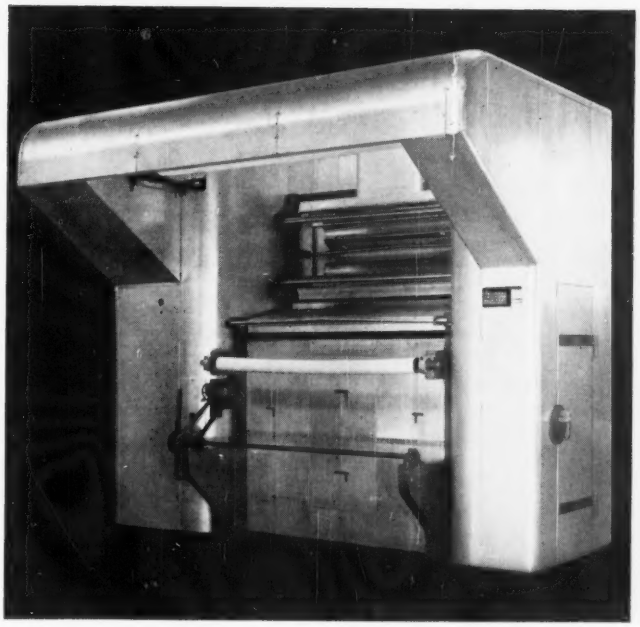
U.D.C.677.474.745.32.

2. Inventors, Development

The first solvents for polyacrylonitrile were found in 1931/32 by DR. HERBERT REIN (deceased),

"NATIONAL"
HEAT SETTING MACHINE

Offers All That's New in Versatility...Efficiency... Economical Operation...



FOR NYLON, DACRON and OTHER SYNTHETIC BLENDS . . . and FOR RESIN CURING

Developed by "NATIONAL" engineers in cooperation with leading Nylon processors, this modern machine incorporates the following important advantages:

CONTINUOUS AUTOMATIC AIR COOLING SYSTEM . . . an integral part of the machine that meets this vital requirement with fool-proof efficiency. CONTROLLED, REPRODUCIBLE TENSION . . . effected by a special mechanical operation under highly sensitive control. BURNER OPERATION AND CONTROL . . . the heated cylinders are equipped with automatically controlled gas burners which transfer their heat to a constantly circulated "Dowtherm" core. Temperature on each cylinder is individually adjustable by a controller sensitive to plus or minus 0.2° F. Tests have shown gas consumption of less than 85 cu. ft. per hour at a speed of 50 yards per minute.

* * *

A heat-reflective enclosure aids in maintaining greater uniformity and thermal efficiency. Exhaust gases are continuously withdrawn from each cylinder. Cylinder bearings operate at room temperature while cylinders are functioning at full heat. Micro-grooved roll surfaces reduce filling shrinkage.

* * *

The "NATIONAL" Heat Setting Machine is designed for continuous feed; a wide range of variable speeds; and operating temperature of 500° F. and higher. It is of rigid, durable construction, with every detail meeting the highest standard for quality and reliability.

Arrangements can be made to see a "NATIONAL" Heat Setting Machine in operation, and for running tests on samples of your own cloth in a standard unit. A phone call will take care of the details.

THE NATIONAL DRYING MACHINERY CO.
LEHIGH AVENUE and HANCOCK STREET
PHILADELPHIA 33, PENNA.

New England Agent: Jones & Hunt, Inc., Emerson Avenue, Gloucester, Massachusetts. Southern Agent: F. W. Warrington, Charlotte, N. C.

who also made the first experiments to produce threads from such solutions in the laboratory of the Kunstseide-Technische Zentrale of the former I. G. Farbenindustry A.G. at Wolfen. Later H. REIN discovered the organic solvents, important for the process, which could be used technically (α-pyrrolidone, dimethyl formamide) [DBP. 915,034 of 4.14.1942—see 9.] Fibers of polyacrylonitrile were experimentally produced in 1943 and already at that time the trade name "PAN-Seide" respectively "PAN-Faser" was proposed.[101]

Experiments of the Japanese Y. MAMIYA, S. MATSUI and S. KAMBARA[1]: Spinning of filaments from a solution of polyacrylonitrile dissolved in sodium- or potassiumrhodanide, coagulation bath ethyl- or propylalcohol. Later improved method: Dissolving of polyacrylonitrile in e.g. 72% sulphuric acid (whereby the polyacrylonitrile is partially hydrolized), spinning in hot water or in diluted sulphuric acid, and treating at 200°C with stretching of about 300% ("*Sinsen*").[68]

Independent of the German research, the Du Pont Co. began studies concerning this matter in their Pioneering Research Section of the Rayon Department in 1942;[6, 16] the first part of applications for U. S. Patent is dated June 17, 1942, the main patents were applied for during 1944—see 9. Polyacrylonitrile fibers have been produced experimentally for military purposes since 1942 under the designation "ANP"[104] and later "Fiber A"; production of smaller quantities for the textile industry began in their acetate plant at Waynesboro, Va., in 1944.

3. Starting Material

Acrylonitrile (vinyl cyanide) $CH_2=CH-CN$ which according to O. BAYER and P. KURTZ [DRP. 728,767] can be obtained directly from acetylene and prussic acid:

$$\underset{\text{Acetylene}}{CH\equiv CH} + \underset{\text{prussic acid}}{HCN} \rightarrow \underset{\text{acrylonitrile}}{CH_2=CH-CN}$$

Acrylonitrile is a fluid which boils at 78°C. The polymerization of acrylonitrile takes place in aqueous emulsion, while ammonium persulphate is added as catalyst. This is continued until a molecular weight of 40,000 to 150,000 is reached.[14]

4. Method of manufacture[14]

Polyacrylonitrile is not thermoplastic and decomposes before reaching a melting point. Therefore, it is impossible to apply the melt extrusion method used in the manufacture of the other synthetic fibers, and it was only after having found suitable solvents that the production of fibers was made possible.

Spinning solution usually: 20 to 25 percent solution of polyacrylonitrile in dimethyl formamide.
Spinning method: The dry spinning as well as the wet spinning method can be used. The dry spinning takes place at 100° to 130°C in hot air or in inert gas (applied to PAN,[79] Orlon[6]); wet spinning among others in glycerine (130° to 140°C) as coagulation bath whereby the glycerine dissolves the amide while the polymer remains undissolved, or in a solution of calcium chloride [see Brit. P. 583,939 resp. 584,548 of the I.C.I., of 1944.]

Aftertreatment (stabilizing): The threads pass with a velocity of 3.6 m/min through rollers heated from 165° to 180°C and are then drawn off with a velocity of 36 m/min. Because of the tenfold stretching the crystals are arranged in straight lines and an increase in strength, form 0.6 g/den. to about 4.3 g/den., takes place.[3] For the production of staple fiber the tow is crimped and cut, and the fibers are opened.

5. Chemical Constitution

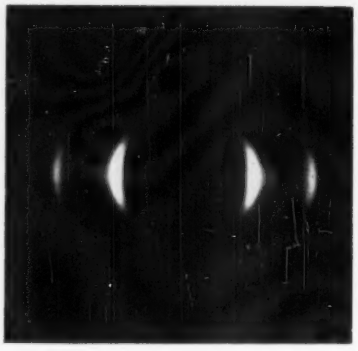
$[CH_2=CH-CN]$, i.e. polyacrylonitrile

$$CH_2-\underset{\underset{CN}{|}}{CH}-CH_2-\underset{\underset{CN}{|}}{CH}-CH_2-\underset{\underset{CN}{|}}{CH}-CH_2-\underset{\underset{CN}{|}}{CH}$$

Molecular weight 60,000 to 100,000[97] or to 200,000[98]

6. Properties

Appearance: white to light cream or amber.
a) to c) see table on page 52.
Dielectric constant (Orlon 81): 5.0 to 4.0[15]
heat of wetting, mean (Orlon 81): 1.74[45]
specific heat (Orlon 81): 0.36 kcal/kg. °C[100]

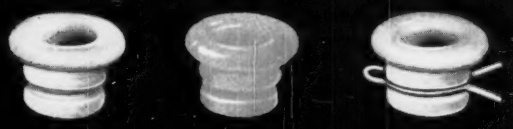


X-Ray Diffraction Diagram of the drawn Orlon acrylic fiber.

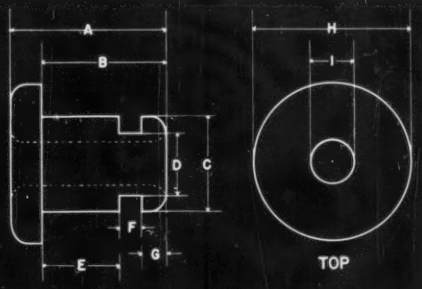
X-ray diffraction diagram[16] of the drawn fiber is highly oriented. The diffuseness of the off-equatorial reflections is indicative of disorder along the chain axis. The comparative sharpness of the two prominent equatorial reflections indicates the high degree of order in one lateral direction. The spacing of 5.3 A is associated with the distance between polymer chains through the nitrile group.[16]

d) *Chemical behavior:*
Burning test . . . . melts, then bursts into flame and burns with a yellow sooty flame.
The residue is hard and brittle.
Dry distillation . . . reaction to litmus paper (damp) first neutral, then acid.
Resistance to gases, acids, alkalies and other chemicals:[6, 12, 68]
very good to industrial gases, dust and soot
very good to mineral acids up to medium concentration (dissolved only in conc. sulfuric acid and conc. nitric acid)
sufficient to weak alkalies,
complete to the usual organic solvents (dissolved in dimethyl formamide and in butyrolaceton)
e) *Biological stability:*
very good to rotting (after 18 weeks, Orlon 81 loses only 8 percent of strength[12])
very good to bacteria, moulds, insects (beetles, moths, also termites[4])
f) *Resistance to weathering:* including radiation

MITCHELL-BISSELL *Quality* GUIDES



PORCELAIN GROOVED ROVERS



Available in either our Standard White Glaze or with our Blue Satin Finish.* Wire clips to fit all patterns can be furnished. We also make more than sixty different sizes of plain (ungrooved) Rovers.

MITCHELL-BISSELL CO. PATTERN NO.	A	B	C	D	E	F	G	H	I
No. 2292	3/16"	9/64"	11/64"	9/64"	1/16"	1/32"	3/64"	15/64"	1/16"
No. 1596	13/64"	5/32"	17/64"	3/16"	3/64"	3/64"	1/16"	11/32"	7/64"
No. 2454	15/64"	3/16"	.300"	1/4"	5/64"	3/64"	1/16"	3/8"	1/8"
No. 2351	1/4"	3/16"	3/8"	21/64"	3/64"	3/64"	3/32"	33/64"	15/64"
No. 2508	5/16"	15/64"	.175"	5/32"	9/64"	1/32"	1/16"	1/4"	5/64"
No. 2364	5/16"	15/64"	19/64"	15/64"	1/8"	3/64"	1/16"	3/8"	9/64"
No. 1761	5/16"	1/4"	5/16"	1/4"	9/64"	3/64"	1/16"	25/64"	1/8"
No. 2251	11/32"	1/4"	9/32"	7/32"	5/32"	1/32"	1/16"	19/32"	9/64"
No. 2549	23/64"	1/4"	21/64"	9/32"	1/8"	1/16"	1/16"	7/16"	3/16"
No. 2502	3/8"	9/32"	15/32"	25/64"	143"	1/16"	5/64"	21/32"	7/32"
No. 2181	25/64"	19/64"	17/64"	7/32"	11/64"	1/32"	3/32"	11/32"	1/8"
No. 2654	13/32"	9/32"	.325"	1/4"	5/32"	3/64"	5/64"	27/64"	1/16"
No. 2597	27/64"	23/64"	.303"	1/4"	.245"	3/64"	1/16"	3/8"	1/8"
No. 2503	37/64"	21/64"	.240"	3/16"	.070"	3/64"	.212"	7/16"	.085"

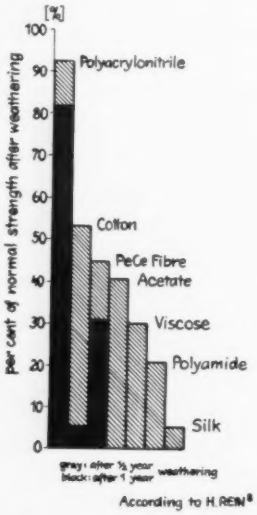
MITCHELL-BISSELL CO. • TRENTON, NEW JERSEY

Southern Representative: R. E. L. Holt, Jr. & Associates, Jefferson Bldg., Greensboro, N. C.

MITCHELL-BISSELL CO.

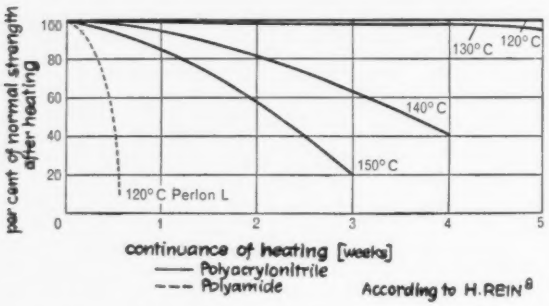
*REG. U.S. PAT. OFF.

by the sun and by UV-light: outstanding (see figure); the degree of stability is dependent on the details of manufacture (stretching)[27]



strength [in % of the normal moist strength]
after ½ year of weathering ... 92%
after 1 year of weathering ... 80%
} Dolan[17]
after 1½ years of weathering 77%, Orlon 81[16]

Heat resistance: withstands for a short time up to 150°C; resistance against prolonged heat influence: see diagram.



Shrinking of yarn in water at 100° C: 1.5%,
in air at 100°C: 0.3%, at 150°C: 3.6%, at 200°C: 7.0% (½ hour each)
strength when hot (in silicone oil)[12] at 100°C: 70%, at 150°C: 40%, at 200°C: 10% of the normal moist strength at 25°C
strength when cold at −40°C[12]: 135%
at −57°C[8]: 129.0% (12"/min) resp. 136.7% (3"/min) of normal moist strength

g) *Toxicity:* not dangerous; no dermatitis.[8]

h) *Affinity for dyestuffs:* differs according to the degree of stretching, generally lower with continuous filament yarns than with staple fibers. Highly stretched *continuous filament yarns* cannot be dyed with the normal dyeing methods and dyestuffs (direct, sulphur, acid, chrome) or if at all, only in pastel shades (with selected dispersed acetate resp. basic dyestuffs). This characteristic property can be used to get novelty effects in fabrics with other rayons when piece-dyed. The affinity to dyestuffs can be improved by dyeing at high temperature[25] (120°C) or by the use of agents ("carriers") which swell the fiber, such as o-/p-Phenyl-phenol,[15] or by the cupro-ion-method[22, 26] in connection with the latter.

Staple fibers can be dyed more easily (the affinity of the different types, however, varies); selected dispersed acetate dyestuffs, as well as suitable indigoid vat dyestuffs and basic dyestuffs are used, for darker tones at temperatures of 120°C. Best results are obtained by using the cupro-ion method with a modified technique[15] which in this case needs no carriers in connection with acid or selected direct dyestuffs. Special methods have been developed for piece dyeing and printing.[10, 11, 19]

i) *Identification and differentiation* from other chemical fibers and among themselves:

"Type-Reaction":[33] cold conc. nitric acid dissolves, 85 percent formic acid does not dissolve the polyacrylonitrile fibers.

Differentiation between Orlon 41 and Orlon 42: Immerse sample for 5 minutes in 5% solution of sodium hydroxyde at 80°C. Orlon 42 only dyes to cream. Orlon 41, however, will be dyed red orange. After rinsing and neutralizing Orlon 41 becomes yellow, Orlon 42 loses its color completely.[38]

Differentiation between Orlon 42 and Acrilan: Boil sample for 5 minutes in a water solution (based on the weight of water): 0.2% Du Pont Anthraquinone Blue SWF, conc. 150%, and 0.5% acetic acid. Orlon 42 is not stained while Acrilan is dyed to a medium blue shade. Dyed Orlon 42 remains unchanged, while the shade of Acrilan is altered.[102]

7. Products

Acrilan: staple in 2, 2½, 3, 5 and 8 den. bright or semi-dull, crimped; in 2½ den., also high-bulk staple having a shrinkage of 20% in single fiber.

Creslan (formerly X-54): staple 3 den. in pilot quantities.

Crylor: filament yarn in 45/16, 90/32, 90/64, 180/64, 270/96 and 360/128 den., resp. staple fiber in 1.8 and 3.6 den.

Dolan-acryl: in tow form in 4500/1.5 den., 3000/1.5 den., 3000/1.0 den., 2400/1.0 den., 1600/1.0 den. and 1600/0.9 den., bright and dull, also spun-dyed, and as yarn (spun directly according to a new direct producing method) up to Nm 200/1.

Dralon: staple in 1½, 2, 3, 6, 10 and 15 den. (1½ to 3 den. also spun-dyed), delivered also in tow form.

Orlon 81: continuous filament yarn in 75/30, 100/40, 150/60 and 200/80 den. semi-dull;

Orlon 81: fiberstock (cut) with 2½ den. titre of the single thread as against Orlon 41 and 42 with 3 resp. 1½ den. titre.

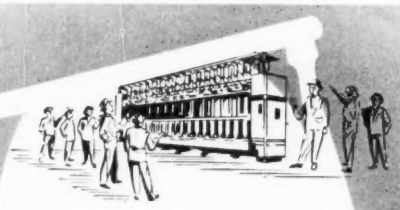
Orlon 42 staple fiber: in 2 and 3 den. semi-dull, also as tow with 330,000 resp. 312,000 den.

PAN-endlos: in different titres, **PAN-Faser:** in 1½ and 3 den.

Redon: only as staple fiber with 2, 2¾ and 3¾ den.

X-51: continuous filament yarn in 75/45, 100/60 and 150/90 den., **X-51 staple:** in 3 den.

Wolcrylon: only as staple fiber in 3¾ den. semi-dull.



In 1952
SACO-LOWELL *Introduced*
the **GWALTNEY SPINNING FRAME** —
the only revolutionary spinning improvement in 100 years

NOW IN 1955

OVER 356,000 SPINDLES OF
SACO-LOWELL GWALTNEY SPINNING
ARE IN DAILY OPERATION —

A major step in the automation program of those mills

Gwaltney Spinning Frames have demonstrated beyond any doubt their ability to produce yarns that are stronger, far more even, and of higher grade than the same count yarn produced from the same stock with conventional spinning — and this improved quality has been produced at considerably lower operating costs and resultant higher profit.

The superiority of Gwaltney Spinning is achieved through a combination of many developments including

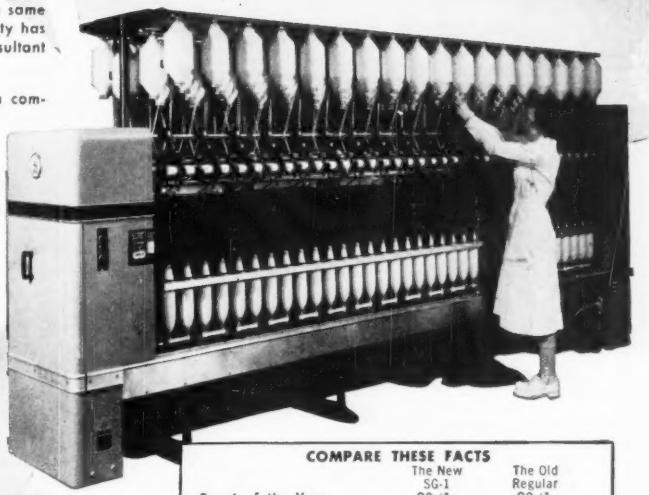
- Balloon controls
- Practically uniform tension at all stages of the doff, regardless of bobbin size and ring rail position Plus, many other special features

Saco-Lowell Gwaltney Spinning Frames can be successfully used for processing all of the current commercially used fibres: cotton, wool, synthetics and blends.

They can be equipped with Shaw Drafting element, Duo Roth, Standard Gwaltney, SS-4G or Z-6.

The purchase of Gwaltney Spinning is an "investment in progress" that pays off in higher profits and top quality.

A Saco-Lowell engineer will be glad to give you full details, or, arrange a demonstration.

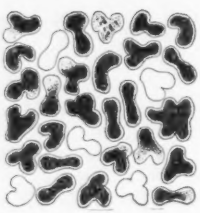


COMPARE THESE FACTS

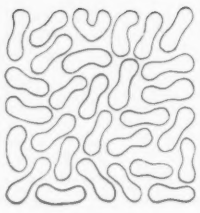
	The New SG-1	The Old Regular
Count of the Yarn	20/1	20/1
Length of Yarn Traverse	10.62"	5.88"
Ring Size	3.0"	2.0"
Weight of Yarn on Bobbin	12 oz.	3.2 oz.
Yards of Yarn on Bobbin	12,600	3,360
Unwinding Time at 500 yds./M	25.2 Min.	6.72 Min.
Bobbins creeled per Spindle per Hr. at Winder	2.39	8.93
Spindle Speed	7,920	7,920
Traveler Speed	6,220 Ft./M	4,146 Ft./M
Speed of 1" Front Roll	170 R.P.M.	170 R.P.M.
100% Production per Spindle per Hr.	.053 Lbs.	.053 Lbs.
Turns per Inch of Twist	14.9	14.9
Doffing Cycle	14.73 Hrs.	4.14 Hrs.
Estimated Efficiency	96.1	91.2
Net Production per Spindle Per Hr.	.0509 Lbs.	.0483 Lbs.
Increase for SG-1	5.4%	.....

SACO-LOWELL
60 BATTERYMARCH STREET, BOSTON 10, MASS.
Shops at BIDDEFORD and SACO, MAINE, and SANFORD, N. C.
SALES OFFICES: CHARLOTTE • GREENSBORO • GREENVILLE • ATLANTA

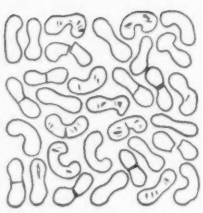
Polyacrylonitrile Fibers



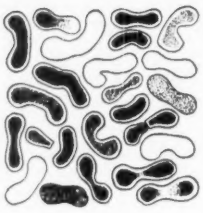
Orlon 81 2½ den. (× 250)



Orlon 42 3 den. (× 250)



PAN endlos 2.5 den. (× 250)



Relon 3¾ den. (× 250)

PURE POLYACRYL

6. Properties	Orlon 81[12]	Orlon 41[27]	Orlon 42	PAN endlos	PAN-Faser	Redon[42]
(a) Microscopical appearance: Longitudinal view	C Partly structureless with some longitudinal lines, partly more or less finely pored.	F With more or less close fine longitudinal fissures, resp. pores even within the same fiber	F Structureless partly slightly wound and with some longitudinal cracks	C Slightly longitudinally lined otherwise structureless or with some longitudinal cracks	F Slightly wound diffuse brownish with fine longitudinal stripes and cracks	F Extremely finely pored with one or two longitudinal lines
Cross sections, form	Variously shaped and irregular (T-V-, Y-shaped)	Partly handle- partly V-shaped	Longish	Longish with notches on one or both sides and with transverse fissures	Longish, handle- or V-shaped	Longish
contours	Smooth to coarse, lobed	Smooth	Smooth	Smooth	Smooth	Smooth, inside partly pored, dark with lighter brim zone
(b) Technological values:						
Tensile strength (g/den.) and	4.7—5.2[P]	1.5—2.3[P]	1.9[P]		3.0—3.5	2.8—3.3
Extension at break	15—17	26—32[P]	22.5[P]		26—28	30—40
Wet strength (% of normal moist strength)	90	95	95			90—95
Knot strength (% of normal moist strength)	78/69—71[100]					
Strength (% of normal moist strength)	67					52
Elasticity (%) at 50% at 2/3 break load	57					51
Torsion at break[20,105] (Angle of transversal brittleness α_p)	55½—57½°	63°	60—61½°	59½°	52½—53½°	51½°
(c) Physical Constants:	250[66]					
Melting range (°C)	265°[P]	275°[27]				
Density (g/cm³)	1.18[6] 1.17[12P]	1.14[67]	1.14[P]	1.17—1.24[8]		1.14
Moisture absorption (%) At 65% rel. humidity	0.9 (60%)	1—2[67]	1.5[P]			1.3
At 100% rel. humidity		6.1[67]				
Refractive index: n_γ		1.515				
n_α		1.517				
Double refraction, $n_\gamma - n_\alpha$	+ 0.010[84]	− 0.002[44]				

8. Applications

The specific property of the polyacrylonitrile fibers is their outstanding stability against influences of sunlight and weather which predestinates these fibers to be used in fabrics for clothing, household and technical purposes when needed outdoors. Applications for

(a) *clothing and household* (advantages are that they feel warm, do not easily get dirty, launder well and dry quickly): sportswear, raincoats, stockings, swim suits; yarn to provide effect patterns; the material for *tropical clothing*; covering material for umbrellas and parasols, *curtains*, *blinds* and *flags*;

b) *industrial uses: tent materials* and *awnings* (including the sewing thread for the canvas industry), conveyor belts for agriculture and mines, car covers, sails for yachts,* ropes, nets and fishing articles, filter cloth, technical fabrics of all kinds, protective clothing against acids.

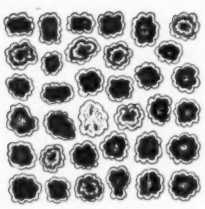
WELDON[102] has published special information concerning the effect the polyacrylonitrile fibers have in blends; see also [28] and [81].

9. Master Patents

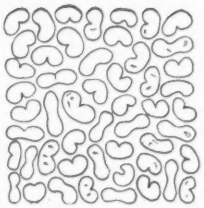
DRP., 631,756: Verfahren zur Loesung von polymerem Acrylnitril [H. REIN (I. G. Farbenindustrie AG.)] of 22.8.34; DRP. 631,527: Verfahren zur Herstellung von Polyacrylsaeureloesungen [H. REIN (I. G. Farberindustrie AG.)] of 9.12.34, resp. the corresponding U.S.P. 2,117,210 and 2,140,921; DBP. 915,034: Verfahren zum Verformen von linearen Hochpolymeren [H. REIN (Cassella Farbwerke Mainkur AG.)] of 14.4.42, resp. the corresponding Fr.P. 883,763/4 and 893,461 [I. G. Farbenindustrie AG.];

U.S.P. 2,404,713: Method for preparing polymeric solutions [R. C. HOUTZ (E. I. du Pont de Nemours & Co., Inc.] of 23.7.46 (applied for 23.6.43, application-in-part of 17.6.42); U.S.P. 2,404,714: 4.11.44, application-in-part 17.6.42).

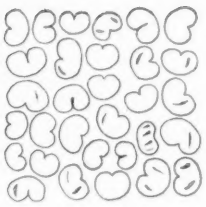
* William Willis, who, following the example of the "Kon-Tiki", crossed the Pacific on a balsa raft and reached the Samoan Islands after 111 days' journey in summer of 1954, used a sail made of Orlon!



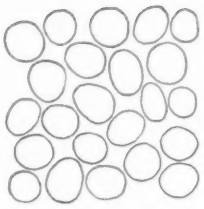
Fil Crylor 2.9 den. (× 250)



Dolan-acryl 1½ den. (× 250)



Acrilan 2½ den. (× 250)



X-51 Staple 3 den. (× 250)

ONITRILE FIBERS

C = Continuous filament yarn
F = Fiber

Fibers of Acrylonitrile Copolymers

Fil Crylor[83]	Fiber Crylor[83]	Dolan-acryl	Dralon	Wolcrylon[85]	Acrilan[89]	X-51[28,29]
					* = improved type[105]	
C Finely pored or with longitudinal cracks with several longitudinal lines	F More or less close finely pored or with longitudinal cracks, mostly with light brim zone	F Mostly structureless sometimes with extremely fine pores, partly with one longitudinal line	F Partly with longitudinal lines, sometimes wound with some longitudinal cracks	F Some longitudinal wound lines	F Extremely finely pored or with numerous longitudinal cracks, with one longitudinal line	C F Structureless except local inhomogeneities, very wavy in longitudinal direction
Roundish	Roundish	Oval, bean or kidney shaped	Longish, handle- or V-shaped	Roundish	Kidney shaped with fissures in the interior	Roundish to oval
Slightly notched partly with lighter ring zone	Slightly notched	Smooth, partly with one notch	Smooth	Slightly notched	Smooth with one notch	Smooth
4,4—5,2 3,3[P]	4,4—5,2 3,3[P]	4,0—5,5	2,5—3,2[P]	3,9—4,7	4,0—4,5 2,5*	C: 3,4—3,9 F: 2,8—3,6
11—15[P]	20[P]	18—22	24—30[P]	12—18	18—20/31*	20—24/20—22
90	90	90—95	80—90[P]	85—100	90/80*	90/90
69		69				55 —
80			50—60[P]	19		75 —
				60		
42	35			56		
55*	52½*	56*			51½*	— 47*
325°[P]	325°[P]	240—250°	235°[P]	250°	235°	290°
1,125[P]	1,125[P]	1,14	1,14[P]	1,17	1,135[21]	1,17/1,17
					1,171[49]	
					1,206*	
2[P]	2[P]	1	~1[P]	0,9	1,5—1,7	1,5—1,6
					1,24*	
					3[67]	
					1,520	1,516/1,515
					1,520*	
					1,524	1,520/1,518
					1,525	
					−0,004	−0,004/−0,003
					−0,005*	

BIBLIOGRAPHY

(*Publication in book form)

1) Mamiya, Y., Matsui, S. and Kambara, S.: Studies on synthetic fibers, I: Spinning of polyacrylonitrile fibers. *J. Soc. Chem. Ind.* [Japan] 44 (1941), Suppl. Binding, 125B-126B.
2) Mamiya, Y., Matsui, S. and Kambara, S.: Studies on synthetic fibers, V: New synthetic fiber from the material obtained by the partial saponification of polyacrylonitrile. *Ibid.* 45 (1942), Suppl. Binding, 385B-386B.
3) Sherman, J. V.: Acrylonitriles . . . a new class of synthetic fibers. *Text. Wld.* 97 (1947), No. 3, p. 101-102, 215-216.
4) Rein, Herbert: Polyacrylonitril-Fasern. *Ang. Chemie* A 60 (1948), 159-161.
5) Du Pont announces new synthetic—Orlon. *Text. Wld.* 98 (1948), No. 9, p. 102a-102b.
6) Quig, J. B.: Orlon acrylic fiber—a new synthetic. *Am. Dyest. Rep.* 37 (1948), 879-880 [Abstract]; *Can. Text. J.* 66 (1949), No. 1, p. 42-44, 46-47; *Rayon & Synth. Text.* 30 (1949), No. 2, p. 79-80, No. 3, p. 67-69, No. 4, p. 91-93; *Papers Am. Assoc. Text. Technol.* 4 (1949), 61-70.
7) Kaswell, E. R.: Low temperature properties of textile material. *Am. Dyest. Rep.* 38 (1949), 127-134.
8) Rein, H.: Die Polyacrylonitril-Faser. *Ang. Chemie* 61 (1949), 241-245.
9) Rein, H.: Die synthetischen Fasern. *Mell. Textilber.* 30 (1949), 243-246, 299-301.
10) Hall, A. J.: Acrylonitrile and fiber synthesis. *Brit. Ray. & Silk J.* 26 (1949), No. 9, p. 71-72, 85.
11) Thomas, R. J. and Meunier, P. L.: The dyeing [and printing] of Orlon acrylic fiber and its use in colored textiles. *Am. Dyest. Rep.* 38 (1949), 925-932.
12) Larsen, W. E., Scheiderbauer, R. A. and Wilfong, R. E.: Orlon acrylic fiber. *Scientific Monthly* 69 (1949), 414-418.
13) Quig, J. B.: Orlon in the canvas goods industry. *Ray. & Synth. Text.* 31 (1950), No. 1, 64-65.
14) Niederhauser, J. P.: Une nouvelle fibre synthetique: l'Orlon. *Teintex* 15 (1950), 305, 307, 309 . . . 321, 323, 325.
15) Döhle, W.: Orlon, die Polyacrylonitrilfaser von Du Pont. *Text. Praxis* 5 (1950), 426-428.
16) Houtz, R. C.: Orlon acrylic fiber: Chemistry and properties. *Text. Res. J.* 20 (1950), 786-801.
17) Chementator: Hydrolysed copolymerisate for easier dyeing [Chemstrand acrylic fiber]. *Chem. Engng.* (1950), 67: Abstr.: *Das Deutsche Textilgewerbe* 53 (1951), 527.
18) Meunier, P. L.: Dyeing of new synthetic fibers. *Am. Dyest. Rep.* 40 (1951), 51-54.
19) Lyonnois, M.: Blanchiment des fils et tissus en polyacrylonitrile. *Teintex* 16 (1951), 163.
20) Koch, P.—A.: Der Bruchverdrehungswinkel als Kriterium für die strukturelle Beschaffenheit synthetischer Faserstoffe. *Textil-Rdsch.* 6 (1951), 111-116, 281-285.
21) Woodruff, J. A.: Introduction to dyeing of Chemstrand acrylic fiber. *Am. Dyest. Rep.* 40 (1951), 402-408; Digest in *Text. Wld.* 101 (1951), No. 8, p. 126-127.
22) Feild, T. A., Jr., and Fremon, G. H.: The copper technique for dyeing acrylonitrile fibers. *Text. Res. J.* 21 (1951), 531-539.
23) Lyle, C. G., Iannarone, J. J., and Thomas, R. J.: High-temperature dyeing of new synthetic fibers. *Am. Dyest. Rep.* 40 (1951), 585-596.
24) Bobeth, W.: Die Einwirkung von Chlorzinkjodlösung auf Polyacrylonitrilfasern im mikroskopischen Bild. *Faserforschg. u. Textiltech.* 2 (1951), 492-497.
25) *Weber, F., and Martina, A.: Die neuzeitlichen Textilveredlungs Verfahren der Kunstfasern (einschl. Patentlisten über Herstellung der chemischen Faserstoffe), p. 114-116, 196-197. 1951, Springer-Verlag, Wien; I. Suppl. Vol. 1954, p. 78-86, 168-169.
26) Blaker, R. H., and Laucius, J. F.: The copper method for dyeing Orlon acrylic fiber. *Am. Dyest. Rep.* 41 (1952), 39-43.

27) Holmes, D. F.: Orlon acrylic staple. *Papers Am. Assoc. Text. Technol.* 7 (1952), 85-96; Digest *Text. Wld.* 102 (1952), No. 4, p. 126-128, 274, 276.
28) Meet the newest synthetic fiber—X-51. *Text. Wld.* 102 (1952), No. 3, p. 123-125.
29) Cresswell, A.: Physical and chemical properties of X-51. *Papers Am. Assoc. Text. Technol.* 7 (1952), 111-113, 119-122.
30) Bendigo, C. W.: Spinning, weaving, knitting X-51. *Ibid.* 114-115, 119-122.
31) Peiker, A. L.: Scouring, dyeing and finishing X-51. *Ibid.* 116-122.
32) Bendigo, C. W., and Peiker, A. L.: It's not hard to spin, weave, knit, dye X-51 acrylic fiber. *Text. Wld.* 102 (1952), No. 5, p. 114, 195, 196, 198, 200, 202, 204, 206, 209, 210.
33) Koch, P.—A.: Faserstoff Tabellen: Erkennung und Unterscheidung der verschiedenen Arten von chemischen Faserstoffen. *Textil-Rdsch.* 7 (1952), 273-277; *Z. ges. Textil-Ind.* 54 (1952), 622-626; *Mod. Text. Mag.* 35 (1954), No. 1, p. 36, 42, 44-46.
34) Heyn, A. N. J.: Observations on the birefringence and refractive index of synthetic fibers with special reference to their identification. *Text. Res. J.* 22 (1952), 513-522.
35) Szlosberg, E.: Dyeing Orlon. *Am. Dyest. Rep.* 41 (1952), 510-516.
36) Fronmuller, G. D.: Some of the variables connected with the dyeing of Orlon. *Ibid.*, 578-580.
37) Bunn, H.: Cost and availability of raw materials of the synthetic fibers. *Ind. Eng. Chem.* 44 (1952), 2128-2133.
38) Dennison, R. W. and Leach, L. L.: Blends containing the new man-made fibers. *J. Text. Inst.* 43 (1952), 473-495.
39) Soday, F. J.: The Chemstrand Corp. and Acrilan acrylic fiber. *Papers Am. Assoc. Text. Technol.* 8 (1952-53), 12-15, 21-24.
40) Whytlaw, G. G.: The processing of Acrilan acrylic fiber. *Ibid.* 16-18, 21-24.
41) Scholer, W. E.: Fabric development with Acrilan. *Ibid.* 19-24.
42) Phrilon und Redon aus Neumünster. *Z. ges. Textil-Ind.* 54 (1952), 1216-1217; Whrieth, J.: Die vollsynthetischen Fasern Phrilon und Redon. *Textil-Rdsch.* 9 (1954), 83-84.
43) Koch, P.—A.: Chemische Faserstoffe—ein Ueberblick über ihre Vielfältigkeit und ihre Eigenschaften. *Textil-Rdsch.* 7 (1952), 559-585; *Mell. Textilber.* 34 (1953), 707-710, 820-822, 914-920, 1025-1027, 1115-1117.
44) Royer, G. L.: Identification of synthetic fibers by microscopical and dye staining techniques. *Papers Am. Assoc. Text. Technol.* 8 (1952-53), 32-41.
45) Wylie, W. C., Jr.: Preliminary study of the sizing of staple Orlon and Dacron. *Am. Dyest. Rep.* 42 (1953), 11-13.
46) Meunier, P. L.: Dyes for Orlon and their application. *Ibid.* 39-43.
47) Mehrmann, L.: Gebrauchseigenschaften und Verwendung von Orlon in der Textilindustrie. *SVF Fachorg. f. Textilveredlung* 8 (1953), 39-45.
48) Blaker, R. H.: Principles of copper dyeing of polyacrylonotrile fibers: the controlled redox-potential method. *Am. Dyest. Rep.* 42 (1953), 76-80.
49) Rotevatn, S.: Prinsipielle syntetiske fibrer—Orlon acrylic fiber. *Norsk Tekstil Tidende* 34 (1953), 137-138, 141-144.
50) Mauer, L. and Wechsler, H.: Modern Textiles Handbook: Acrylics. *Mod. Text. Mag.* 34 (1953), No. 2, p. 42-44, 48, 78.
51) Rhoads, W. G.: Aqueous Dyeing of Orlon and Dacron. *Ibid.* No. 2, p. 57-58.
52) Reif, W.: Nachweis von Orlon und die Unterscheidung von Nylon und Perlon. *Mell. Textilber.* 34 (1953), 219.
53) Taylorson, R. B. and Larson, T. W.: Printing acrylic and polyester fibers. *Am. Dyest. Rep.* 42 (1953), 99-107.
54) Katayama, M. and Kambara, S.: Studies on acrylic synthetic fiber, VIII: On the condition and bath temperature of the n-butyl-alcohol coagulation bath spinning; IX: On the condition for the spinning solution of the n-butyl-alcohol coagulation bath spinning. *J. Soc. Text. & Cell. Ind., Japan (Sen-i Gakkaishi)* 9 (1953), 264-268, 268-273.
55) Katayama, M. and Kambara, S.: Studies on acrylic synthetic fiber, X: On the effect of drawing and stretch of the n-butyl-alcohol coagulation bath spinning; XI: Studies on the alcoholic coagulation bath; XII: On the dry heat drawing condition of polyacrilo-nitril fiber. *Ibid.* p. 328-332, 332-337, 337-342.
56) Sorkin, M.: Schneller Nachweis von Polyacrylnitril-Fasern. *Textil-Rdsch.* 8 (1953), 321.
57) Meunier, P. L., Laucius, J. F., Brooks, J. A. and Thomas, R. J.: New developments in the dyeing of Orlon acrylic fiber. *Am. Dyest. Rep.* 42 (1953), 470-473.
58) Two tests for differentiating between Orlon types. *Mod. Text. Mag.* 34 (1953), No. 9, p. 92.
59) Happe, W. and Hensel, O.: Ueber den Mechanismus der Cuproionen-Methode beim Färben von Polyacrylnitrilfasern. *Reyon, Zellw. & and. Chemiefasern* 31 (1953), 675-678.
60) Soday, F. J.: Production and Properties of Acrilan. *Am. Dyest. Rep.* 42 (1953), 635-638.
61) Ham, G. E. and Gann, P. W.: Preparation of dyeable fiber-forming compositions, I: Reaction of acrylonitrile-vinyl chloroacetate copolymers with amines. *Ind. Eng. Chem.* 45 (1953), 2320-2323.
62) Ham, G. E., Craig, A. B. and Gann, P. W.: Preparation of dyeable fiber-forming compositions, II: Reaction of acrylonitrile-alkenyl chloroacetate copolymers with amines. *Ibid.* p. 2323-2326.
63) Laucius, J. F.: Recent advances in dyeing Orlon acrylic fiber and Dacron polyester fiber and blends of these with other fibers. *Am. Dyest. Rep.* 42 (1953), 792-796.
64) Bogaty, H., Hollies, N. R. S., Hintermaier, J. C., and Harris, M.: Some properties of serges made from blends of wools with acrylic type synthetics. *Text. Res. J.* 23 (1953), 536-544.
65) Bright, N. F. H., Carson, T. and Duff, G. M.: The heat of wetting of fibres. *J. Text. Inst.* 44 (1953), T587-595.
66) Gorduenko, A.: Fraktionierung der synthetischen Spinnstoffe. *Faserforschg. u. Textiltech.* 4 (1953), 499-507.
67) *Davidshöfer, F.: Polyacrylnitrilfasern. In Pummerer, R.: Chemische Textilfasern, Filme und Folien, p. 599-609. 1953. F. Enke Verlag, Stuttgart, Germany.
68) *Fremon, G. H.: Synthetics—Vinyl Fibers. In McFarlane, S. B.: Technology of Synthetic Fibers. p. 135-193. 1953. Fairchild Publications, New York, N. Y.
69) *Tomonari, P.: New Fiber Developments in Japan: Polyacrylic Fiber. *Ibid.* p. 245.
70) *Morgan, L. B.: Polyacrylonitrile. In Hill, R.: Fibres from Synthetic Polymers, p. 55-63. 1953. Elsevier Publ. Co., Amsterdam-London.
71) *Fremon, G. H.: Vinyl and Acrylic Fibres. *Ibid.* p. 454-505.
72) Katayama, M. and Kambara, S.: Studies on the acrylic fibers, XIII: *J. Soc. Text. & Cell. Ind. Japan* 10 (1954), 3-7.
73) Hunyar, A. and Reichert, H.: Ueber die Polymerisation von Acrylnitril. *Faserforschung u. Textiltech.* 5 (1954), 1-8.
74) Boyo, G.: The story behind Acrilan: the decline and rebirth of a fiber. *Mod. Text. Mag.* 35 (1954), No. 1, p. 60, 62.
75) Toepffer, H.: Färben von synthetischen Fasern, insbesondere von Polyacrylnitrilfasern (PAN). *Mell. Textilber.* 35 (1954), 47-52.
76) New, H. E.: The improved Acrilan fiber. *Text. Wld.* 104 (1954), No. 2, p. 97-100.
77) Ham, G. E.: Spinning solvents for polyacrylonitrile. *Ind. Eng. Chem.* 46 (1954), 390-392.
78) Neue Faser in der Tschechoslowakei "Nitrilon". *Reyon, Zellw. u. and. Chemiefasern* 32 (1954), 252.
79) Duch, M.: Wolcrylon-Faser. *Plaste u. Kautschuk* 1 (1954), 134-135.
80) Quig, J. B. and Dennison, R. W.: The complementary nature of fibers from natural and from synthetic polymers. *Text. Res. J.* 24 (1954), 361-373.
81) Sayre, J. F. and Weldon, A. J.: Fabrics from the newer synthetic fibers [Dacron, Orlon]. Paper presented to the 1st International Congress of Man-Made Textiles, Paris, 1954.
82) Laucius, J. F. and Meunier, P. L.: The dyeing of Orlon acrylic fiber and Dacron polyester fiber and blends with other fibers. *Ibid.*
83) Parisot, A.: Les matieres textiles nouvelles, leurs proprietes et leurs possibilites d'application. *Bull. Inst. Text. de France* No. 47 (1954), 7-47.
84) Rein, H.: Die Polyvinyl-Faserstoffe. *Z. ges. Textil-Ind.* 56 (1954), 812-814.
85) Kunze, W.: Färbemöglichkeiten der Polyacrylfasern. *Textil-Praxis* 9 (1954), 660-662.
86) Stevens, R. F.: Dyeing and finishing Orlon acrylic fiber. *Am. Dyest. Rep.* 43 (1954), 409-411.
87) Bousset, R.: Proprietes physiques, mecaniques, chimiques de l'Orlon. *L'Ind. Text.* No. 800 (1953), 496-498.
88) Rudolph, L.: Eigenschaften, Verspinnung und Einsatzmöglichkeiten von Wolcrylon. *Textil- u. Faserstofftech.* 4 (1954), 479-486.
89) Ham, G. E.: Polymerization of acrylics. I: The chemistry of polymerization of the acrylics; II: Acrylonitrile copolymers and relationship to dyeability. *Text. Res. J.* 24 (1954), 597-604, 604-614.
90) Fluegel, W., Peter, A. and Egli, H.: Das Sandocryl-Verfahren zum Färben von Polyacrylnitrilfasern nach der Cuproionenmethode. *Textil-Rdsch.* 9 (1954), 509-514; also in french in *Teintex* 20 (1955), 81, 83-85, 89, 91.
91) Mueller, J.: Stückfärberei und Ausrüstung von Polyacrylnitrilgeweben. *Mell. Textilber.* 35 (1954), 1006-1012; 36 (1955), 470-476.
92) Weldon, A. J.: Engineered blends for tomorrow's fabrics. *Papers Am. Assoc. Text. Technol.* 10 (1954), 34-50.
93) *Moncrieff, R. W.: Artificial Fibers, 2nd Edit., p. 310-333: Orlon—Acrilan—X-51. 1954. National Trade Press Ltd., London.
94) *Harris, M.: Handbook of Textile Fibers. 1954. Harris Research Laboratories, Washington, D. C.
95) Pelz, W.: Ueber Eigenschaften, Verarbeitung und Gebrauchswert der Wolcrylongarne, bzw. Wolcrylonmischgarne. *Textil-Faserstofftechn.* 5 (1955), 96-98.
96) Tvede, M.: Orlon, fremstilling og egenskaber, med soerligt henblik pa farveritekniske forhold. *T. for Textilteknik* 13 (1955), 21-28.
97) Hall, A. J.: "Tailor-made" polyacrylonitrile fibers. Improving the dyeing properties of synthetics. *Fibres* 16 (1955) 88-92, 101.
98) Stern, H.: Beitrag zum Färben von Fasermischungen mit Orlon 42. *SVF. Fachorg. f. Textil-veredlg.* 10 (1955), 168-172.
99) Fluegel, W., Duerst, A. and Metzger, E.: Das Drucken und Foulardieren von Polyacrylnitrilfasern nach dem Sandocryldruckverfahren. *Textil-Rdsch.* 10 (1955), 172-175.
100) *Koch, P.—A.: Faserstoffe, p. 322-420 in Landolt-Börnstein: Physikalische, chemische und technische Zahlenwerte, 6. Edit., Vol. IV, Part I. 1955. Springer-Verlag, Berlin.
101) Laucius, J. F., Clare, R. A., and Brooks, J. A.: Dyeing Orlon acrylic fiber and blends with other fibers. *Am. Dyest. Rep.* 44 (1955), 362-366.
102) How to Tell Orlon from Acrilan. *Mod. Text. Mag.* 36 (1955), No. 6, p. 83.
103) Personal report of Dr. Herbert Rein (deceased).
104) Personal report of L. L. Leach, Textile Fibers Dept., Du Pont Co.
105) Koch, P.—A.: unpublished.

German publication in "Zeitschrift fur die gesamte Textil-Industrie" Vol. 57, 1955.

Avisco Integrity Plan

(Concluded from Page 8)

"We are not setting up any new standards likely to confuse the industry," Mr. Wachter said. "Requirements are already defined in the American Standards Association, L22, standards now accepted by the whole textile industry and originally based on our Crown Test Program which ended in 1947. This is essentially a co-operative effort to confirm and publicize quality standards that are already in existence."

Shirts made from Burlington first quality-tested fabric carrying the Avisco Integrity Tag will be marketed next spring in Phillips-Jones Van Heusen shirts.

Color Mixing

(Continued from Page 42)

ing in mind that the latter must not be used for colors containing alkalis. Even stainless steel has been known to corrode in the presence of chrome mordant dyestuff solutions used as standards for reduction with thickenings later.

Wooden tubs have been used but are not generally to be recommended for vat colors, as the alkalinity shrinks the staves and leads to loss of print paste through leakage where made-up colors have been standing for a considerable time. Copper cans or drums have a long life and are clean to use but are expensive.

Galvanized buckets are very useful at the printing machines where they can be placed underneath the lowest color-boxes conveniently being filled up from time to time from a larger container. Two to three-gallon stainless steel or galvanized buckets are also used in screen printing where they can be carried conveniently up and down the long tables following the printers for replenishments.

Straining Equipment. This is a very important operation in color-mixing, because it is necessary for the print paste to be quite free from all foreign hard particles, pieces of thickening, etc., which might either damage the copper roller surfaces—stick in the engravings or damage the edges of the doctor blades, with resultant "printer's damages".

The straining operation may be dealt with under three heads, as follows: (a) hand-straining, (b) machine or vacuum straining, (c) homogenizing.

Hand-straining. This, as already pointed out, is the helper's job although a good color-mixer should also be a good strainer. It will be found that not everyone is suited to this particular aspect of color-mixing, because of the difficulty some operatives find in developing the right straining technique. In the first place, the straining-cloth is fastened on top of the container in such a manner that it cannot slip into the container when the cloth is filled with print paste. Generally, most of the print paste can be worked through the cloth by hand movement but at the end of the operation the cloth with the remaining print paste has to be removed from the top of the container without allowing any of the print paste to flow over the side of the straining-cloth into the receptacle. This would obviously defeat the end in view as even the smallest amount of grit, etc., allowed to pass in this way can give rise to much damage in printing.

Thick print pastes, of course, require to be dealt with in small batches which can be conveniently handled by hand-strainer and these require even more technique than thinner colors.

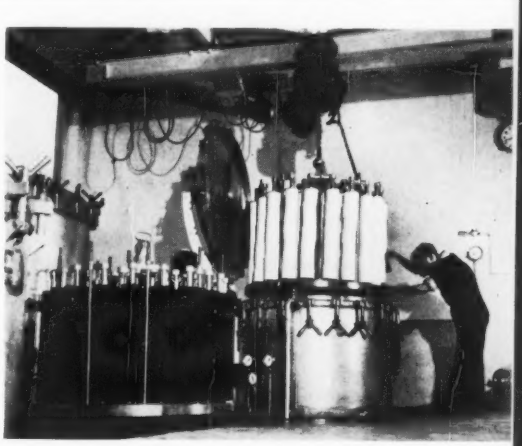
Mechanical Strainers. These are only used for very large batches of print pastes in certain styles of prints. For this class of work they can handle large amounts of print paste very expeditiously. The general system is based on the vacuum principle whereby the print paste is drawn through the sieve-like structure into a container underneath.

The obvious objection to these machines for small amounts of print paste is that of the very frequent washing required with many changes of color. Besides, hand-straining is considered more efficient for the comparatively small amounts generally used in the majority of printing styles.

Homogenizer. The homogenizing machine has found many useful applications. The main idea is to produce a print paste in as finely divided a state as possible with the result that a gritless and speckless free-flowing product is obtained. It is claimed for some of these machines that a higher color yield (transfer of dye from the thickening to the fabric during steaming for fixation) is obtained. This, however, is not always the case and the opposite effect has occasionally been observed. The use of such machines depends for the most part on the principle of forcing the print paste through a small orifice—a very small portion at a time—under pressure up to 1000 p.s.i.

There are also machines on the market which make use of a series of five techniques—(a) forcing through orifice, (b) pulverization, (c) shock, (d) whirling-thinning, (e) colloidal milling. It is claimed for all types of such machines that, in addition, to the benefits outlined above, penetration and levelness of the prints is also improved. All these claims are, however, modified in particular instances but, in general, it may be observed that in difficult cases the printing qualities of a print paste are noticeably improved by homogenization which, of course, in all cases is carried out subsequent to straining by one of the methods already outlined.

From the British Dye Industry



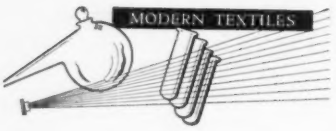
Loading a high temperature dyeing machine in the pressure dyehouse of Stevenson Dyers Ltd.

Weighing, measuring and washing equipment completes the necessary arrangements for carrying on full-scale color-mixing.

Weighing Machines. These usually include one small and one large scale. Where engraved roller printing and silk screen printing are both carried on three weighing machines may be required. The small scale weighing from 1/16th oz. to 2 lbs. or 1 gr. to 1 k. gr. A medium size scale may weigh up to 10 lbs. or 3 to 4 k. grs. while the large scale up to 50 lbs. or 25 k. grs.

Measuring. Copper or stainless steel measuring ladles are commonly used varying from 1/28th pint to half-gallon. Prepared thickenings are measured with these ladles into print paste containers and the required amount of dyestuff, either in paste form or as a standard solution, is added with constant stirring.

(Continued on Page 68)



Report from JAPAN

By B. Mori

Quotas for Cottons—*OSAKA*—The mounting fury of protests in the United States against growing imports of Japanese cotton textiles and other cotton products finally caused the Government and the industries concerned to establish export quotas for 1956. This was a sharp reversal of the policies previously held, and caught most observers by surprise, because the United States Government itself has been firmly behind Japan in resisting the import-quota demands of the American industries affected.

At this writing, the exact size and form of the quotas have not been worked out. But the over-all intention is to restrict 1956 shipments to approximately the level of actual shipments in 1955. These figures are still well above the point at which American competitors are willing to concede Japan a "reasonable share" of the U. S. market. However, no one here is willing to give up customers and markets already won, even though there is some willingness to call a halt to the rapid expansion of sales as a means of forestalling possibly more drastic action on the American side.

Advance Orders a Factor—Heavy advance ordering, mainly for the first half of 1956 shipment, has already established a minimum below which actual shipments in 1956 cannot be reduced. Without the restraint of self-imposed quotas, shipments to the U. S. in 1956 might very well have reached (based on the indications of the advance orders) almost 200,000,000 yards of cotton textiles and 5,500,000 dozen cotton blouses, equal to another 150,000,000 yards. To this must be added cotton sheets, pillow cases and sport shirts, all of which add up to another substantial yardage. Last year's exports to the U. S. are estimated at about 120,000,000 yards of cotton goods and about 3,000,000 dozen blouses. The figure for cotton cloth is a little below the prewar high.

Spun Rayon Exports Higher—The spectacular gains in exports of spun rayon fabrics continued into the third quarter of 1955, making a total of 365,000,000 yards for the first nine months of the year—more than double the 150,000,000 yards sold in the same 1954 period.

The Government's Economic Council, in its six-year plan just published, has even greater hopes for this branch of the industry, mentioning it as one of the several on which greatest hopes are placed for increasing Japan's trade income. This council predicts that sales will reach 686,000,000 yards by 1960.

The council also predicts a gain of 30 per cent for cotton textiles and 50 per cent for raw silk. On the import side, increased purchases of raw wool and raw cotton will be limited to about 20 per cent over the 1955 level; while imports of wool pulp will be increased by about 50 per cent.

With the single exception of filament yarn, exports of all other rayon products gained during the first nine months of 1955. Exports of staple are up about two-and-one-half times; spun yarns up almost 50 per cent; filament fabrics up almost 10 per cent, over the same 1954 period.

Law to Curb Mill Growth—The Ministry of International Trade and Industry has prepared a bill for the Diet which will give it power to force cotton and woolen mills, but cotton spinners mainly, to eliminate excess capacity. This situation was discussed in detail in this Letter last month. As an interim measure, the Ministry is reducing the foreign exchange allocations for imported raw materials to any cotton mill which continues to add spindles just to get ahead of the cut-back program.

News Notes—The raw silk stabilization program has been in everyone's mind, as prices remained below 200,000 yen a bale for many weeks, often coming close to the 190,000-yen level at which the Government is committed to buy in support of prices. One small purchase actually was made, but the market quickly rebounded.

PAPERS OF THE
AMERICAN ASSOCIATION FOR
TEXTILE TECHNOLOGY INC.®

AATT

VICARA
its manufacture and properties

By George L. Walker, Jr.

THE MANUFACTURE of Vicara is carried out by the Virginia-Carolina Chemical Corp. in its plant at Taftville, Conn. While under the limits of this paper a complete description is not given of the production and properties of Vicara, its manufacture may be outlined in five steps: solution preparation, spinning, stretching, hardening, and finishing operations.

The basic raw material for Vicara is commercial zein, an alcohol soluble protein from corn, with a reported molecular weight of 24,800.[1] Before it reaches the plant for conversion to fibers, the zein has been extracted from corn gluten and specially treated. It is received as a dry powder, dissolved in aqueous alkali to form a thick, viscous solution, and after further treatments in preparation for spinning, is pumped to the lines supplying the spinnerets.

In spinning Vicara the zein solution is forced through thousands of tiny openings in the spinnerets, which are specially constructed to permit their immersion in the acid coagulation bath. As the solution is extruded into this bath, it is coagulated in the form of discrete filaments. In preparation for the stretching operation the filaments are allowed to cure lightly in the presence of formaldehyde.

In stretching, the fibers are drawn on rollers in contact with hot water, and in this manner may be extended to several times their original length. There is evidence that stretching causes the molecular chains within the fiber to align in some degree along the fiber axis, much as filaments are aligned in a yarn by drawing. In order to preserve the strength which has been imparted to the fiber by stretching, the newly formed structure must be set. Accordingly, the fiber is removed from the stretch tank and subjected to dehydration while still under tension.

In addition to being stretched and set, the fibers must also be fixed or hardened so that they may withstand textile operations and fabric wear. Various degrees of hardening are imparted, depending on the uses intended for the fiber. In general, this treatment involves contact of the fiber under controlled conditions with formaldehyde.

After washing and drying, the fiber may be bleached, crimped, treated with finishing agents, and/or staple-cut, depending upon requirements subsequent to shipment from the plant.

While it is possible in the manufacture of Vicara to achieve a range of physical properties for various end-use requirements, the present discussion will not cover this range but rather will be concerned chiefly with a comparison of certain of the dry mechanical properties of a particular sample of unbleached Vicara[2] with those of samples of 80's wool, cashmere, and vicuna (Table 1).

George L. Walker, Jr.

Mr. Walker was chemist in the Materials Testing Section of the Virginia State Department of Commerce, and since 1952 he has been a senior chemist with the Research Department of the Virginia-Carolina Chemical Corporation.

Presented at the December meeting of the American Association for Textile Technology, New York, N. Y.

Like the Vicara, each of the natural fibers was reported to be below three denier in fineness. 80's wool is a fiber of the Merino class. Cashmere is obtained from the Orient, and vicuna from South America and is designated as the rarest and finest of the fibers called wool.

Table 1: FIBER DENIER
(Grams per 9,000 Meters)

Zein Fiber	2.4
80's Wool	2.5
Cashmere	2.9
Vicuna	1.9

The measurement of fiber tenacity (Table 2) is of great interest, for it is reasoned that no fabric can be stronger than the material of which it is made. In the load required to break the fiber, close similarity is noted between the Vicara zein fiber and 80's wool.

Table 2: FIBER TENACITY
(Grams per Denier)

Zein Fiber	1.20
80's Wool	1.17
Cashmere	1.43
Vicuna	1.09

The elongation to break (Table 3) is regarded as a valuable indication of the degree of flexibility, a property in which each of these fibers appears to stand high among textile materials.

Table 3: ELONGATION TO BREAK
(Ultimate Elongation)

Zein Fiber	37%
80's Wool	38%
Cashmere	34%
Vicuna	34%

Tensile recovery (Table 4) is a measure of the fiber's ability to recover its original length after it has been stretched and relaxed. This property is of special interest in connection with the shape retention of fabrics. Among the reported values, the Vicara zein fiber is intermediate at 5% extension and at the low margin of the range for extension to 20%.

Table 4: TENSILE RECOVERY

	5% Stretch	20% Stretch
Zein Fiber	67%	31%
80's Wool	65%	35%
Cashmere	70%	37%
Vicuna	66%	34%

The work required to stretch a fiber (Table 5) involves the forces which oppose the stretch and also their effective range of action. This property is studied as an index of toughness. In the present case, cashmere is lowest at 5% extension and highest at 20%, while Vicara zein fiber is lowest at 20% and one of the highest at 5%.

Table 5: WORK TO STRETCH
(10^6 ergs per cm^3)

	5% Stretch	20% Stretch
Zein Fiber	24%	136%
80's Wool	23%	145%
Cashmere	20%	157%
Vicuna	24%	143%

Work recovery (Table 6) adds a further dimension to the concept of resilience. In tensile recovery, the return toward original length is reported at (or nearly at) zero load. In work recovery, however, the force with which the fiber resists extension is compared with the force with which it presses back toward its original length in the face of opposition.

Table 6: WORK RECOVERY
(%

	5% Stretch	20% Stretch
Zein Fiber	44%	17%
80's Wool	47%	17%
Cashmere	51%	18%
Vicuna	46%	15%

In the compliance ratio (Table 7), numerical values are sought for a property in which Vicara and certain of the wools excel. When these fibers are extended, they offer at first a substantial resistance to stretch. Then follows a region of rapid yielding, but only to a point, for in the final portion of the cycle they are again firmly resistant. It is suggested that this property of compliance in Vicara when properly utilized in fabric construction may offer a three-way combination of liveliness, deep softness, and ultimate firmness in terms of fabric performance.

Table 7: COMPLIANCE RATIO
(Denier per Grams)

Zein Fiber	1.5
80's Wool	1.3
Cashmere	1.0
Vicuna	1.2

Perhaps the most serious deficiency of the man-made protein fibers as a class, has been their notoriously low wet strength. In comparison with the reported range for wool of .76-1.63 grams per denier,[3] it appears that with the exception of Vicara, a wet strength of .5 gram per denier has not been reached in commercially offered man-made protein fibers.[4] In the development of Vicara zein fiber there have been repeated break-throughs into the wool range, and it is expected that more and more this range will be approached in the commercially available fiber.

The chemical properties of Vicara may be summarized in large measure by the single adjective, inactive. That this quality is inherited partly from the zein itself is suggested by data taken from a compilation by David Traill[5] (Table 8). Assuming the analysis applicable to the commercial product, it may be concluded from this partial list of amino acids that zein is about 1½ times as rich in the so-called inactive groups as wool. And further, if it is assumed that all of the acid amide groups in zein fiber have been removed from the field of action by their incorporation into covalent cross-linkages, it follows that Vicara is nearly three times as rich in its content of inactive groups.

Table 8: AMINO ACIDS IN ZEIN AND WOOL KERATIN
Grams Acid/100 grams Protein

	Acid	Zein	Wool
Inactive			
	Glycine	——	6.5
	Alanine	9.80	4.1
	Valine	3.98	5.5
	Leucine	15.40	9.7
	Isoleucine	4.30	——
	Proline	9.00	7.2
	Phenylalanine	7.60	1.6
	Total	50.08	34.6
Acidic			
	Aspartic Acid	3.40	7.27
	Glutamic Acid	35.60	16.00
	Amide Ammonia	3.64	1.18
	Total	42.64	24.45

(Continued on Page 61)

VICARA

in woven fabrics

By Alfred Greenfield

VICARA can be put to practical use and with very gratifying and luxurious results in practically all forms of women's wear and men's wear apparel. Vicara is a very flexible fiber and excellent results will be obtained if careful and practical consideration is given to the following items:

1) The fiber or fibers with which Vicara is blended
2) Uniformity of blend
3) Twist facts
4) Construction and finishing.

Careful consideration must be given to the type of fiber, grade or denier as the case may be, and the proper fiber length. The proper denier, staple length, and type; i.e., natural or bleached, crimped or uncrimped Vicara would then be selected to complete the blend. The end use (type of fabric), type of finish, and price range should be very seriously considered before any fabric is started into works. Vicara can be readily blended with wool, cotton, silk, or any of the man-made fibers. With respect to fiber diameters, 3 denier Vicara is equal to 80s wool; 5 denier is equal to 62s, but has the hand of a 70s wool; and 7 denier is equal to 56s wool. While we have correlated the fiber diameters of Vicara with wool grades, it should be noted that the true results of Vicara are akin to fine cashmere, even in the coarser deniers. The tensile strength of Vicara is comparable to wool.

Vicara, cotton and rayon are combined in the fabric of this tailored host coat by J. M. Wise Co., which retails for about $25

The percentage of Vicara used in the blend is governed by the type of fabric desired. Some fabrics have been made on the woolen system, with only 20 to 25% Vicara. The Vicara hand is good, but when you compare this with blends of 35% or more, you will readily appreciate the greatly increased cashmere-like hand. In general, 35% to 50% produces the best results. There are some exceptions to this, one being a men's wear worsted flannel in which 30% Vicara is recommended at present, because in the wet finishing process Vicara fulls readily with wool, but in its own properties is not a felting fiber. On the other hand, woolen sport coatings have been successfully and attractively made with 60% of Vicara.

It is extremely important that the fibers used in the blend are properly and uniformly blended. Good blending should produce yarns that are uniform in strength and evenness if the right fibers and percentages were originally selected. Uniformity of blend becomes increasingly important as you vary the types of finishes such as clear finish, flannel type, and velour or suede types. Lack of uniformity will produce open spaces in fulled or gigged finished goods.

Vicara is very similar to wool and, therefore, in spinning will require about the same amount of twist or perhaps a trifle less than that required in a 100% wool yarn. Since Vicara does not pill, extra twist is not required. The type of fabric being produced will, of course, govern the amount and direction of twist. Vicara is a versatile fiber. This may be surprising to many who have seen the lofty types of fabrics that have been made in Vicara blends and who have noted

(Continued on Page 66)

Presented at the December meeting of the American Association for Textile Technology.

Alfred Greenfield

Mr. Greenfield has had diversified experience in the textile industry. Among the positions he held prior to becoming Director of Fabric Development of the Fiber Division, Virginia-Carolina Chemical Corporation were Fabric Development, S. Strook & Company; Assistant General Manager, Pacific Mills; Worsted Division Manager, M. T. Stevens & Company; and Assistant Merchandise Manager, Amerotron Corporation.

VICARA

its processing and dyeing

By Lyman Billings

VICARA, the zein fiber, as you have already heard, is a different type of man-made fiber than any of the others being offered. It is made from a natural raw material rather than being a true synthetic. Because of this, it has some properties like the natural fiber which it resembles, and it has other properties like the synthetic fibers because it is made like a synthetic.

The properties of Vicara in general, although not always, thus resemble wool or cashmere chemically, whereas physically in many respects they are similar to the other man-made fibers. It is important that we keep this concept in mind when we are processing Vicara in a mill. We are continually striving to do this and to evaluate mill experience on the basis of the characteristics of the fiber or fibers being run.

I do not intend in this report to make a list of fiber properties and then demonstrate where each property should be considered during mill production. Rather than discuss the properties, I believe it will be more helpful if I take up a few of the important highlights as we have learned them and discuss each one briefly.

We have found from experience that the early operations in a mill are the critical ones for Vicara. Good yarns of excellent strength and evenness, and poor yarns which are weak and uneven can be made from the same lot of fiber. The difference between the two is practically invariably due to the way the fiber was handled in picking and carding. Any time we see weak yarn or fly waste composed of very short fibers, we immediately look for trouble back in the card room.

Vicara, like all synthetics, cards very easily. There is no need to clean foreign matter from the fiber because there is none present. The fibers have a smooth surface and do not entangle as does wool. Therefore, the carding operation is used merely as a means of opening the stock and converting it to an even, usable sliver.

Because of this, we recommend very open settings, moderate speeds, and heavy feeds in picking and carding, and we find that very strong satisfactory yarns are made consistently when these preliminary processes have been handled in such a way as to prevent excessive fiber breakage.

There is a direct relation between breakage in carding and fiber denier. In the past we have tended to recommend the use of lower denier fibers to attain a luxurious hand. We have learned that in many cases this is a mistake.

Because of its natural resiliency, Vicara fibers feel richer than other fibers of equal fiber diameter. In making a blend with wool, we can take advantage of this cashmere-like hand in coarser denier fiber and instead of using the fine 3 denier fiber, we can successfully use a 5 denier fiber with improved results.

We obtain from this two definite advantages. In the first place, each fiber, being 5 denier instead of 3, is stronger by roughly 66%. We get little fiber breakage in carding and, therefore, strong, even yarns. In the second place, as I have mentioned previously, the hand of the fabric may even be improved over the fabric using the finer denier.

Because it is made from protein, Vicara dyes like wool. All of the wool colors can be used, including acid, metallized, and chrome dyestuffs. No special procedures are necessary, and the fastness obtained is very close to the fastness of the same dyes on wool.

When dyeing a blend of wool and Vicara, however, the problem is not so simple. While both fibers dye with the same dyestuffs, the rate at which the dyestuff is absorbed by the fiber varies. With many dyes, the wool will "steal" more than its share of dye before the Vicara can absorb it, and we end up with a poor union.

However, by careful selection of dyes, we can use those that give good union dyeings. Many of the colors in common use can be used on this blend satisfactorily. Selected acid, neutral dyeing metallized, chrome, or metallized colors are being used for a complete range of shades.

In blends with cotton or rayon where the fibers require different classes of dyestuffs, little difficulty is encountered in getting satisfactory union shades. It is also a simple matter to dye one fiber and leave the other white or to dye the two fibers different colors. There is a wealth of information on blends of rayon or cotton with wool which can be directly ap-

Presented at the December meeting of the American Association for Textile Technology.

Lyman Billings

Prior to becoming Director of Technical Service of the Fiber Division, Virginia-Carolina Chemical Corporation, Mr. Billings was Chief Chemist at the Stillwater Worsted Mills and at the Arlington Mill. He worked for several years in the textile chemical and dyestuffs field.

Warmth and a soft hand are contributed to this robe by Vicara. The fabric is 25% Vicara, 25% rayon and 50% cotton

plied to the Vicara blends of the same type.

Orlon and Vicara require basic or modified basic colors for the Orlon and acid colors for the Vicara. By the selection of those basic colors that stain Vicara only lightly, satisfactory one-bath dyeing formulae have been developed and are working very well.

Acrilan and Vicara blends are also being dyed satisfactorily in a one-bath method through selection and balancing of dyestuffs. Nylon and Vicara blends offer no problems. Although they both take wool colors at different rates, it is possible to partially resist the nylon with one of several chemicals in the dyebath so that unions are quite easily obtained. This applies both to the normal and the fast dyeing types of nylon.

Dacron and Vicara can be dyed union in one-bath with proper selection of dyestuffs. In this case we usually use Dowicide A as a carrier for the Dacron and di-ammonium phosphate for the Vicara. These two chemicals appear to work together very well.

It should be noted that blends of Vicara with the newer man-made fibers, with the exception of nylon, can be cross-dyed as well as dyed in union. Vicara is considerably more resistant than wool to acids, alkalis, and heat. Normal finishing procedures that can be used on wool can be safely used on Vicara. Fulling, scouring, carbonizing, and high temperature processes such as curing are used on Vicara fabrics, without difficulty.

Since it is a smooth surfaced fiber, Vicara does not full. However, in fulling blends of wool and Vicara, we frequently find that the presence of the Vicara speeds up the fulling process. Therefore, these blends should be fulled cautiously or there may be a tendency to over-full. Although the Vicara does not full of itself, the strength of the fulled fabric is satisfactory. In fact, we have non-woven felts containing 40% Vicara which are stronger than all-wool felts made by the same company on the same equipment.

Full decating or hard pressing may tend to produce stiffness or boardiness in Vicara blends. Light semi-decating or moderately light pressing will prevent this. If boardiness is encountered, dry working or flexing will usually eliminate it.

When finishing Vicara blends with cotton or rayon, there are a few precautions which I would like to mention. These precautions, when observed, give us very fine finished materials in which the luxurious softness and comfort of the Vicara are quite prominent.

The use of resins in Vicara blends tends to mask the soft hand of Vicara and they should not be used where hand is important in the finished fabric. For the same reason, warp sizing must be removed completely as even small quantities of residual size will give the fabrics a poor hand. For dimensional stability in fabrics, Sanforizing or the Avcoset type of finish give good results.

In sweaters and other fabrics, high-bulk yarns are commonly being used. These are made by blending stretched and relaxed fibers. We have not been successful so far in stretching Vicara and holding that stretch until the fabric is finished. However, Vicara is being blended with heat-stretched Orlon or Acrilan where it acts as the unstretched portion of the blend. When these fabrics are finished and the stretched fibers pull in to bulk the fabric, the stretched fibers tend to go to the core of the yarn leaving loops and ends of Vicara on the surface where its softness and comfort become prominent. Very fine sweaters are being made on this basis.

In this connection it should be remembered that the proportion of heat-stretched fibers in the finished yarn should be the same as it is in, for example, a 100% Acrilan or Orlon yarn.

These points I have mentioned are the highlights for the mill man, the converter, the knitter, or the dyer to consider when he begins his work with fabrics containing Vicara.

Vicara—its manufacture (Continued from Page 58)

This unreactive quality in zein may pose a problem to the chemist in his search for conditions sufficiently drastic to promote the reactions of fiber formation. But unreactivity in the finished fiber is a highly desirable property. For example, Gillespie[6] reports that Vicara will not melt; loses very little strength at temperatures up to 350°F., and that the resistance of Vicara to acids, alkalis and organic solvents is unique among natural and synthetic fibers. From their studies on the chemical resistance of Vicara, Pollard and Wilson[7] reported that samples immersed for one hour in 9% hydrochloric acid suffered no loss in wet strength, and that those immersed in 20% sodium hydroxide solution for three hours lost only 5%.

Such then are some of the elements in the manufacture and properties of Vicara, a man-made protein fiber from zein ,which today is making its own special contributions in the field of textile raw materials.

REFERENCES

1. Likes, C. J., Virginia Institute for Scientific Research, Private communication.
2. Sookne, A. M., Harris Research Laboratories, Private communication.
3. Textile World's Synthetic Fiber Table, McGraw-Hill, New York, (1955).
4. Jenkins, H. S., Table II from "Proteins as Fiber-Forming Materials", presented at the Symposium on Protein Fibers, Division of Polymer Chemistry, ACS, New York, September 16, 1954.
5. Traill, D., *P. Soc. Dyers and Col.* 67, 257-70 (1951).
6. Gillespie, J. S., "From the Cornfield to the 'Haut Couture'", *Chemurgic Digest*, 14, 19 (1955).
7. Pollard, H. P. and Wilson, E. L., Virginia-Carolina Chemical Corporation. Private communication.

VICARA
its advertising and promotion

By Richard H. Stinnette

You will continue to hear about, read about, and see widespread advertising of Vicara built up in leading magazines, newspapers, and trade publications for this coming spring and fall. Each year and each season thus far have served as a springboard for us to expand into a healthier textile market for Vicara.

Each year our Vicara program, through expanded activity, is growing larger and larger to meet the multiplying demands of our industry. The mere act of advertising does not automatically guarantee an increase in sales. If, for example, a product has inadequate distribution, a lot of sales will be lost simply because you cannot expect the consuming public to run from one store to another until they do find this product.

We, of Virginia-Carolina Chemical Corp. have found that the merchandising and promotion behind any advertising program is a necessary requirement to give any advertising program its maximum mileage—both before and after an ad appears. This we try to accomplish through a close and careful examination of our ultimate target.

The best way to explain this is by setting up a hypothetical case that I will refer to as "manufacturer X." Manufacturer X is basically a sportswear manufacturer, one that has a fine name in both the trade as well as retail operations. His firm covers the entire United States, so, naturally, is capable of a very wide and thorough distribution. For quite a few months we have been working closely with manufacturer X in the development of a new end product for a Vicara blend in the knitted outerwear field. This has meant a close contact of our firm with every production facet that will be necessary before this product can be launched to the consuming public.

Close contact with our spinners to be certain of the proper blend and proper yarn structure, close contact with the knitter and the dyer, a close contact from A to Z—all a necessity, so that we will be able to *prevent* rather than to have to cure at some later date.

When the garment is completed to our manufacturer's satisfaction as well as our own, numerous tests are made by this firm, independent laboratories, and the manufacturer himself. All of these are made with one question in mind—to find out whether this product will give top performance once it has reached the consumer. Any and all errors must be eliminated before this product is given our final stamp of approval. This, to us, is all a pre-requisite and a vital necessity to any successful promotion.

Fashion plus function is what we are aiming for in this new Vicara blend being manufactured by company X. Our technicians with their know-how have worked out the functional aspects. To the manufacturer we offer the services of our fashion director to assist them in any possible way from this level, styling, co-ordination of color, etc.

At the same time we are quite concerned as to how the retailer will re-act and receive this new product made from a Vicara blend; consequently, we pull in the services of our retail training department, who are given the complete story of our idea, intent, and purpose. Through their retail experience they discuss the end product with manufacturer X until not a question is left unturned in their mind regarding this new use of a Vicara blend. Upon receipt of sample garments this department will visit with the major buying offices in the area who represent retail outlets from coast to coast. Through this department's final report, we are often able to improve upon our product. This, again, is all a part of promotion and merchandising.

Virginia-Carolina Chemical Corp. in an effort to reach the retailer and consumer will set up an extensive program which will cover the trade, retailer and the consumer. Through advance reprints of ads we are able to set up a battery of mailings, hammering away at our target, selling a specific Vicara product as well as the merits of Vicara from a general approach. We urge manufacturer X to make this as big as possible by initiating like mailings to his thousands of retail outlets from coast to coast, sending out suggested ad material, direct ad mats, plus all of the merchandise information that is necessary to accomplish a successful selling job with this new Vicara blend in a new end use. Our retail training department will move into key cities before this promotion breaks, setting up sales training for store employees in an effort to simplify the selling job at the retail level.

Presented at the December meeting of the American Association for Textile Technology.

Richard H. Stinnette

Mr. Stinnette joined Virginia-Carolina Chemical Corporation as Assistant to the Advertising Manager and Editor of the Corporation's Employee Publication. He has been Director of Sales Promotion for the Fiber Division since 1953.

Vicara's versatility is demonstrated in this jersey dress cut from a fabric which combines Vicara with wool. This dress of Wyner's Vicalaine was manufactured by Nantucket Naturals to retail for $50.

Another phase of promotion and merchandising to help push this product is through an intensified publicity program which consists of news releases and glossy photographs to hundreds of newspaper fashion editors throughout the country, giving specific store listings where possible. Scripts to radio and TV stations, edited and timed for use with complete store listings. This all, of course, has to be closely coordinated with manufacturer X in order to have as smooth a program as possible. At the same time we urge the manufacturer to promote this product himself through additional magazine advertising and newspaper tie-ins at the retail level which is the consumer's best sales medium. An all-out effort is made to obtain window as well as interior displays—in other words we want to put this promotion all in one packaged unit. These are the tools we feel we have been successful with when the consumer goes out of a store knowing full well what her product is, having a happy experience with this Vicara product, and then coming back again and asking for Vicara. This is the why of *advertising, promotion* and *merchandising.*

A theme that we have adopted in our knitwear program is, "Something different always sells." We know we have something different from all of the other fibers; we have one, we believe, that can improve intrinsically all other fibers. We are on the threshold of an era of blends, and "Vicara is the fiber that improves the blend." In knitwear presently we have successful blends with nylon, Orlon, Acrilan, and wool.

It is our belief that Vicara blends in knitwear have only scratched the surface and that our horizons are unlimited. This is being proved daily. We are not satisfied to rest on our laurels but are working diligently to develop new and exciting Vicara blends. Through Vicara, the consumer will be the recipient of apparel that has all of the properties of a natural fiber plus the many conveniences offered by man-made fibers.

Vicara's successful use in sweaters is demonstrated in this smart sweater set of Vicara blended with acrylic fiber.

New AATT Members

The Membership Committee of the AATT has passed the following applications for membership: Paul D. Jacobs, Onyx Oil & Chemical Co., 190 Warren St., Jersey City, N. J.; Bernard Greenberg, H. Warshow & Sons, Inc., 15 West 37th St., New York, N. Y.; Joseph G. Dittrich, Swan Fabrics Co., Inc., 426 Broadway, New York 13, N. Y.; Herbert L. Haddad, United States Rubber Co., 1407 Broadway, New York, N. Y.; Frank Barnett, Duchess Fabrics, Inc., 1418 Broadway, New York, N. Y.; Mir Inayeth Ali Khan, Philadelphia Textile Institute, School House Lane & Henry Ave., Philadelphia 44, Pa.; Anthony L. Cartagine, Fairchild Publications, 7 East 12th Street, New York, N. Y.; Norman Thurnauer, The Chemstrand Corp., Decatur, Alabama; Paul P. Chiarelli, Amerotron Corp., 1407 Broadway, New York, N. Y.; Burton S. Sann, Elgin Fabrics Corp., 1410 Broadway, New York, N. Y.; Robert L. Morgan, Hess, Goldsmith & Co., Inc., 356 N. Pennsylvania Ave., Wilkes-Barre, Pa.; Bernard S. Book, M. Hausman & Sons, 8 East 32nd Street, New York, N. Y.

DYEING & FINISHING Trade Notes

Acrilan-Wool Dyeing Assistant

The Arkansas Co., Inc., is offering for commercial use Decomine, a balanced composition of cationic and nonionic ingredients, which is said to produce remarkable uniformity and fine color value in dyeing blends of Acrilan and wool.

According to the company, the dyeing assistant Decomine is an amber color liquid that dissolves readily at all temperatures to a clear solution at working concentrations and maintains this clarity at the boil under conditions employed in dyeing. The product itself is in the neutral pH range and is resistant to sulfuric acid at the concentrations recommended for dyeing process. It has good storage properties under all normal atmospheric conditions.

Persian Blue Towels

A shade of blue said to be unique in the towel industry has been introduced by the Martex Division of Wellington Sears. According to the company, it is a deep turquoise, originally found in ancient Persian ceramics. The color is available only in the "Luxor 1960" ensemble for the present.

Nuvel Softener Introduced

Zimmerman Associates, Guilford College, N. C., announce that Nuvel, a softener, is available for the general textile, laundry, and household trades. Nuvel is said to be a neutral, amphoteric type of softener, and may be used directly in the scouring, dyeing or finishing operations. According to the company, it imparts a soft, full durable hand, and is completely stable to acid, alkali, and high temperatures without yellowing; and it may be used in conjunction with optical bleaches. Nuvel may be added directly to the detergent.

Amerotron Guarantees Slickcord as Colorfast

Amerotron Corp. recently announced that they are guaranteeing the colorfastness of Slickcord, their acetate rayon and nylon cord fabric for spring and summer men's and women's wear. The fabric will be dyed with Eastman GLF dyes in 18 colors. Labels and hangtags will carry the colorfast guarantee.

New Sandoz Surfactant

Sandoz Chemical Works, Inc., is offering a surfactant for cotton, wool and synthetics processing that is said to combine the advantages, and none of the disadvantages, of anionic soap and nonionic detergents. According to the company, Sandopan DTC is chemically different from any soap, detergent or wetting agent on the market. Its wetting and detergent properties make it especially useful in such mill operations as kier boiling, and the scouring of tricot, circular knit goods and Helanca yarn fabrics.

Green Toner Available

The pigments division of American Cyanamid Co. is offering a green toner, Pigment Green B 15-4010, which according to the company, combines good dispersion with alkali and lime resistance. The pigment was developed mainly for the paint and floor covering industry because of its resistance to soaps, alkaline cleaners and lime plaster.

FTC Relaxes Flammability Rules

The Federal Trade Commission has relaxed Rule 7 of the Flammable Fabrics Regulations so as to make life a little easier for the fabric merchant and manufacturer. Under the new version of the rule if an initial test of a plain surface fabric weighing less than 2 ounces per square yard shows a burning time of 3½ seconds or more, that test is sufficient for any fabric of the same fiber composition, construction and finish type.

The new change provides that this class must be tested at least once every three months while in production, but if four consecutive tests of the fabric show that its burning time is not less than 4½ seconds, then no further tests of that class of fabric need be made. Since many classes of fabrics have already received four consecutive production tests under Rule 7 before it was changed, it will now not be required to make any additional periodic tests of such fabrics if they meet the 4½ seconds burning time requirement.

The periodic class tests published by the Combined Textile Associations are sufficient in the case of fabrics testing between 4½ to 6 seconds since such fabrics have already been tested at least four times, and no further class tests will be issued. However, fabrics showing a burning time of over 6 seconds have only been tested three times at 6 months intervals and will have to be tested once more to satisfy the requirements of this amendment.

The new change also amends another portion of Rule 7 by adding a new provision which provides that only one test required for raised surface looped yarn fabrics whose burning time is more than 12 seconds.

When these changes were issued, the head of the flammable fabrics section of the Federal Trade Commission pointed out that these amendments did not change the critical burning time prescribed by the Bureau of Standards and incorporated in the Act, but merely changed requirements concerning reasonable and representative tests under the guarantee provisions of the Act.

Firms with only Two Employees Soon Must Pay Unemployment Insurance Tax

State Industrial Commissioner Isador Lubin urges all small businessmen who have one, two or three employees to examine carefully what their status may be under the New York State Unemployment Insurance law next January.

As a result of 1955 amendments to the law, any firm which has *three* or more employees *on any day* in 1956 will become liable for the unemployment insurance tax on wages for the rest of 1956 and all of 1957 at least; and beginning January 1, 1957, any firm which has *two* or more employees *on any day* will come under the law.

"This means," Commissioner Lubin said, "that even the smallest firm which regularly has only one employee will become liable for the unemployment insurance tax if it employs a couple of temporary laborers or sales clerks or extra employees of any kind for even one day or part of a day in 1956; or if it employs only one extra employee for no matter how brief a period, beginning in 1957."

Any employer who becomes subject to the law through the employment of three persons in 1956 or two persons thereafter is required to declare himself immediately by notifying the Unemployment Insurance Accounts Bureau of the Division of Employment, State Department of Labor, at 800 North Pearl Street, Albany 1, New York. Instructions for compliance with the law will be sent him promptly.

"We are particularly concerned to reach all small employers with word of this change," Commissioner Lubin said, "in order to protect them from later assessment of back taxes and heavy interest if through ignorance they should fail to recognize their liability.

"We have had no experience with the 150,000 firms that have two and three employees, but we are inclined to think that the group includes a great many stable firms that have very low turnover. This very stability means that unemployment insurance claims may be made very rarely by their employees.

"The danger is, therefore, that four or five years from now, through the filing of a benefit claim by a former employee, we will learn for the first time that a small employer should have been paying taxes. We will be compelled under the law to require him to pay all back taxes, plus heavy interest of three-quarters of one per cent per month on all overdue amounts. For a small businessman this could be a staggering blow."

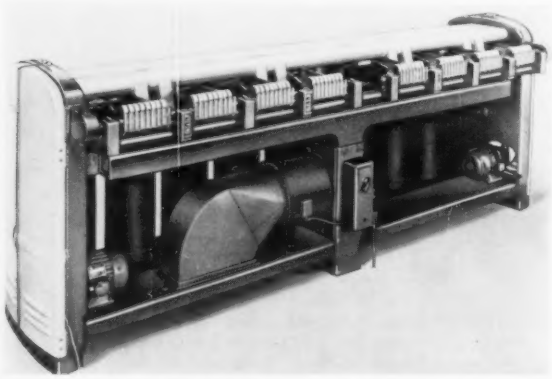
Two New TDI Members

Two new members were admitted to the Institute last month, according to Hilda A. Wiedenfeld, Executive Secretary. They are Carousel Fabrics, Inc., 255 Fifth Ave., and Schottland Textile Mills, Inc., 1441 Broadway, New York City.

Whitin's New Drawing Frame

(Continued from page 33)

and tension gear in each head end and on the calender rolls and tube gears for each delivery. In all, this machine has a total of 152 anti-friction bearings.

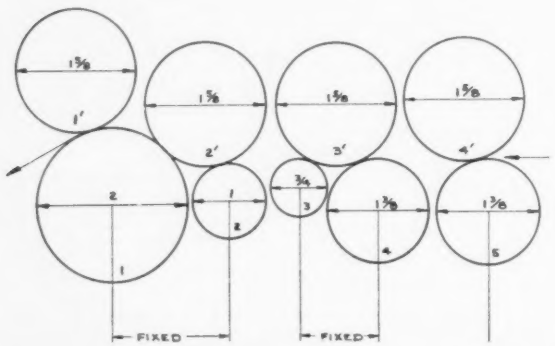


Rear view of Whitin Even-Draft drawing frame showing Pneumafil ducting and heavy frame construction

Drafting Arrangement Extensively Tested

With regard to the use of the four over five roll drafting arrangement, the manufacturer reports that this decision was based on extensive tests with several roll arrangements. The drafting unit must permit very close settings for short fibers; wider settings for fibers up to 3″; must operate successfully at the high speeds desired, and produce high quality sliver. The drafting element used, while it has the same number of rolls in what is conventionally described as a four over five arrangement, differs from other drafting units in several major respects: the location of the draft zones, the size, position, and function of the rolls, the weighting, and the accessory mechanism for removing waste from the top and bottom rolls.

The five bottom rolls from front to back are, in order: 2″, 1″, ¾″, 1⅜″, 1⅜″ in diameter. With the exception of the ¾″ roll, all are regular fluted rolls. The four top rolls are all 1⅝″ in diameter and covered with a standard synthetic cushion. The only roll setting requiring any degree of care is the distance between the second and third bottom rolls (the 1″ and ¾″). Rolls 1 and 2 are fixed, and the distance between 3 and 4 is also fixed. The only adjustments are between 2 and 3, and 4 and 5.



Schematic drawing showing arrangement and diameters of rolls in unique four-over-five drafting arrangement in new Whitin Even-Draft drawing frame.

Since practically all of the drafting takes place between 2 and 3, these are, consequently, the ones that need close setting according to staple length. A break draft must be used at times in the back section. Therefore, provisions have been made to run drafts up to 1.5 at this point. When break draft is used, this back section must also be set to the length of the staple. All roll adjustments are made from above the stands. Thus it is not necessary to work from below the rolls, an awkward and time consuming operation.

Top roll #2 has two points of support: the 2″ bottom front roll and the 1″ second roll. The effective gripping point is where it contacts the 1″ roll and since most of the work is done at this point, adequate pressure must be provided. To guarantee this, 200 lbs. are applied here. Part of this load is carried by the front bottom roll, so there is, in effect, a double grip on the stock. The weight on the front top roll is 60 lbs., with 120 lbs. on the third top roll and 70 lbs. on the fourth. This weighting arrangement is sufficient for any fiber, blend, or staple length, Whitin says.

Top roll #3 also serves a dual purpose. Where it contacts the 1⅜″ roll, it forms a positive bite while the long fibers are allowed to be drawn out of the rolls 3,3′ without breakage. No spacers of any type are used, since it was found that by locating the top roll bearing slide in the proper manner, contact of top roll 3′ with bottom rolls 3 and 4 is held even when its diameter is changed as happens at time of buffing. This arrangement, when adjusted to minimum distance, places all fibers longer than 15/16″ under control. When the rolls 2 and 3 are spaced at maximum spread, staple of 3″ length is accommodated.

New Weighting Mechanism and Other Features

The new weighting mechanism consists of two pivoted arms from each of which are suspended four completely enclosed springs. Pressure is applied to each top roll by the springs and buttons, and held very closely to the required load. Each unit is held in position by means of a toggle actuated by a lever. The weighting can be quickly applied or released on each delivery.

Waste removal is secured by an entirely new device manufactured by Pneumafil. (See detailed story on opposite page.)

Application of air suction for removal of waste fibers and cleaning of the drafting area provides for the first time a successful solution for the problem of removing waste fibers when such very high roll speeds are used, the manufacturer points out.

Other features of the new Whitin drawing frame are:

Use of an extended creel back with a new arrangement of lifting rolls and sliver pan to provide full support of the slivers and reduce stretching.

A non-rotating can table. The cans are carried by the can table in such a manner that the coils are built up in the can without any can rotation. As a result, sliver is free of twist, a factor which improves subsequent drafting.

New Pneumafil System on Whitin Frame

Roll and clearer cleaning done by automatic vacuum equipment

STAFF PREPARED

THE NEW WHITIN drawing frame is equipped with an automatic and continuous system of roll cleaning and clearer picking manufactured by the Pneumafil Corp. Called the "PneumaClear System" the new system is now being offered to the textile industry for the first time on a commercial basis.

According to Pneumafil, the new system ends the need for laborious manual roll and clearer cleaning since this job is now done by this automatic vacuum equipment, an integral part of the frame. Other advantages of the PneumaClear equipment, the manufacturer reports, are the elimination of operating speed limitations heretofore imposed by hand cleaning, and that neither fibers or fly are allowed to accumulate on the rolls and clearers to cause imperfections. The PneumaClear system thus permits greater production and higher quality.

Pneumafil further points out that the new PneumaClear is quite different from the familiar broken-ends collector and cleaning system which has been manufactured for spinning frames for many years by the company. The primary purpose of the new system, Pneumafil points out, is the elimination of "eyebrowing" of roll clearers and greater cleanliness of the rolls.

How System Works

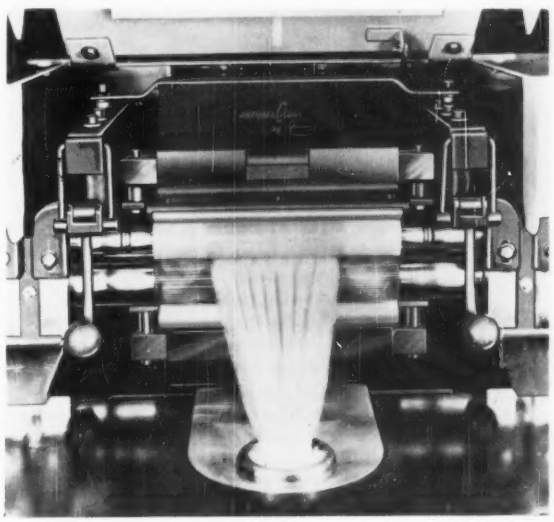
The equipment consists of a series of five clearers for each delivery which clean the first three lines of top rolls and the first four lines of bottom rolls. On the top system each of the first three lines of rolls is equipped with an individual clearer. On the bottom system each clearer cleans two adjacent rolls.

The clearers consist of a rubbing clearer pad made from antistatic synthetic material similar to that used in modern roll covering. Since the top drafting rolls are covered with synthetic roll covering and the bottom rolls are steel, the clearing problems are different. The clearer pad materials and arrangement are also different and designed especially for the cleaning problem involved.

All clearers are mounted so the pads maintain an even gentle touch across the roll surface. These pads lift fly or trash from the roll surfaces. This positive action is necessary to achieve the necessary cleanliness of roll surfaces. The gentle touch prevents "braking" at the rolls which would increase bearing pressure and horsepower requirements. Suction orifices are strategically located at each clearer so that the incoming air will sweep the roll surfaces and carry away the individual fibers as they are lifted from the roll surface by the clearer pads. These orifices also provide transportation air which keeps the entire system always open and clear for continuous service.

These clearers are mounted on detachable connectors which convey lint and air to their respective collecting ducts. The ducts are mounted immediately behind both the bottom row and top row of drafting rolls. The connectors can be lifted or dropped away from the roll for quick inspection without removing them from the machine. The clearer pads are easily detached from these connectors which makes it simple for the operator to remove all of the clearer system components that are adjacent to the rolls. Inspection or maintenance of any of these parts is a very simple matter.

The collecting ducts run the entire length of the frames and exhaust the collected air and waste into the collector unit which serves as a center Sampson of the machine frame. This arrangement places the "vacuum producing" collector unit in the best position for minimum friction losses between the fan and the individual clearers. It saves horsepower and makes possible air handling ducts of minimum size, Pneumafil reports.



A close-up of the new PneumaClear installation on the Whitin Even-Draft drawing frame. It is built-in as an integral part of the frame.

The new PneumaClear equipment, the manufacturer states, as installed on the new Whitin Even-Draft Drawing Frames, cannot be applied to old draw frames. PneumaClear equipment, Pneumafil emphasizes, however, can undoubtedly be developed for other textile machinery. Already it is being successfully applied to the Warner & Swasey Pin Drafter. Pneumafil expects to have further information about new Pneumafil applications in the near future. ■

Color Mixing

(Continued from Page 55)

Washing. Facilities for washing in the form of large wooden tubs are provided for washing all color containers, straining cloths, stirring paddles and measuring ladles. Scrupulous cleanliness in every case is essential, as it is obvious that dirty containers and equipment can lead to much trouble in the form of soiled print pastes, etc.

Protective Clothing. In general the color-mixer requires protection from (a) soiling, (b) chemicals, (c) excessive moisture.

Clothing may be soiled from dyes and thickenings with such chemicals as caustic soda, soda ash, carbonate of potash and "chemic" (sodium hypo-chlorite) for hand-washing. Mineral acids, such as hydrochloric acid for diazotising and where copper pans are "soured" with sulphuric acid both of these acids have to be taken into account so far as protective clothing is concerned.

Rubber gloves serve to protect operatives' hands from dye-staining and dermatitis from alkalis, acids and oxidizing agents like sodium bi-chromate, neutral chromate of potash, hydrogen peroxide, etc., where these chemicals are dispensed from the color-shop for use in the developing and soaping of printed and steamed goods. Such gloves should be of the seamed variety rather than plain black unseamed rubber. The twisting and turning necessary when hand-straining print colors easily bursts the latter type of glove, but good quality seamed gloves (16 ins. long) stand up well to such rough usage though more expensive to buy initially.

Footwear. No item of clothing is more important in the color-shop and experience seems to bear out the fact that there is nothing much more suitable than clogs with wooden soles, ironshod and leather uppers. These keep the feet dry and warm on the wettest floors and in the coldest weather. Contrary to general opinion, these clogs seem to be very comfortable to wear and are practically accident-free so far as slipping is concerned, while cold, wet feet are unknown. It should, however, be borne in mind that attention to the floor of the color-shop is well worthwhile and a weekly wash-down should be imperative. The floor itself is best made from cast-iron grids set in concrete. These will give indefinite wear and maintain a clean, level, good-gripping surface, even when wet and splashed with thickening, etc.

Designations

As already pointed out color-mixing consists, in the simplest terms, of the addition of measured amounts of dyestuff mixed in suitable proportions to produce a variety of shades, to measured amounts of thickenings so that repeat shades can be guaranteed within reasonable limits by good record keeping.

This calls for a system of measuring which is readily comprehened and easily remembered, obviously the simpler the better, always bearing in mind that standardization and simplicity are the key-notes of successful color-mixing and, indeed, of the textile printing process generally.

Starting with the basic assumption that a color or print paste is a simple mixture of so many parts of thickening to so many parts of dye solution, a simple print paste may consist of four parts of thickening to one part of dye solution for a dark shade or color. On the other hand, a light shade may consist of as little as 480 parts of thickening to one part of dye paste, or, in screen printing practice, even smaller proportions. Continuing on the same line of thought the one part of dyestuff solution in each case might be made up of one part of orange and one part of red to give a flame color in the dark shade or a salmon color in the light tone. Tones and shades of infinite variety may be made by mixing dyestuffs in varying proportions to form standards all of which can be reduced with thickenings to give the colors required for any particular color combination.

This method of working leads to the development of print paste nomenclature or designations on the following lines. For example $4\ \frac{1}{1}$ OR Flame $128\ \frac{1}{1}$ OR Salmon. These two examles describe in the first place a deep flame color composed of a mixture of 4 parts of thickening and one part color stand, the latter being made up of one part of orange dye paste and one part red dye paste. The salmon color would be 128 parts of thickening to one part of dyestuff mixture. This type of color recipe or formula may be used for any class of dyestuff prefixed with an indicator letter, such as V for Vat colors, A for Azoics U for Urea process colors, C for Chrome Mordant colors.

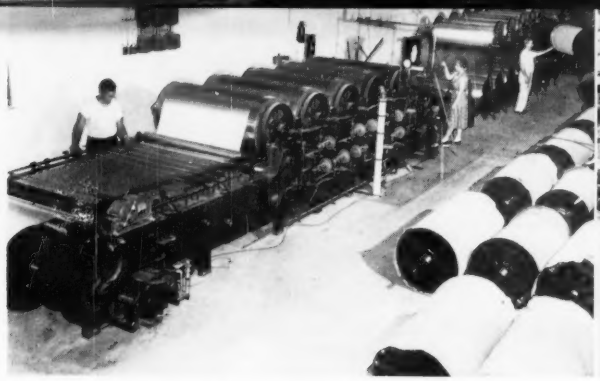
Metric System. This is based on so many parts of dyestuffs standard to 100 parts of thickening and measurements being always by weight. For example, let us suppose a complete range of standard Vat colors made up of pinks, reds, yellows, oranges, blues, greens, etc., consisting of perhaps 10 pinks, 6 reds, 4 yellows, 4 oranges, 12 blues and 30 greens in the range. Pink standards would be numbered 1 to 10, reds 1 to 6, etc. The mixing then might be designated 8/1/100 pink, indicating that No. 8 standard pink would be required in a concentration of one part of standard to 100 parts of thickening. 6/8/100 red indicates red standard No. 6 is required in a concentration of 8 parts of dyestuff to 100 parts thickening.

All color-shop systems are variations of these two by either the measuring or weighing techniques, sometimes a combination of both where it is necessary to weigh out fresh quantities of powdered dyestuff for each making of print paste, as in the case of the soluble Vats and Azoics stabilized or otherwise.

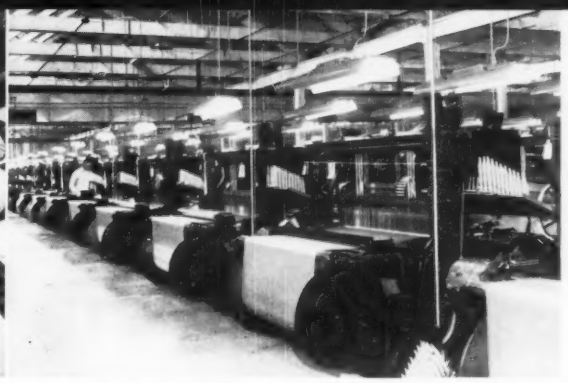
The advantage of the metric weighing system for Vat dyestuffs is convenience of mixing and accurate matching once a system has been set up. A possible disadvantage is the evaporation or drying up of standards which are not often used, thus leading to discrepancies in "repeat" mixings.

Records

Careful records of all color-shop recipes should be kept by the color-mixers, these being duplicated or triplicated by the colorist in the laboratory records together with any remarks on peculiarities noted during mixing or in the subsequent printing and processing of the colors. For examples, some Vat print pastes thicken or go "liverish" when kept, others may froth during printing, "stick-in" in the engravings of the rollers or fill up the meshes of the silk screens, etc. Again, ageing for fixation will reveal that some colors go dull on prolonged steaming while others may deepen, lighten or otherwise display individual traits which should all be noted for future reference. ■



This is one of two new Johnson slashers used in preparing solution-dyed yarns for weaving acetate taffetas and new bulk yarn fabrics



A battery of the new Draper XD looms installed at Schwarzenbach's Juniata Mill, Altoona, Pa., as part of a modernization program

schwarzenbach modernizes with draper looms

A TOTAL of 138 Draper XD 50-inch looms equipped with Diehl drives were installed by Schwarzenbach Huber during the past year as part of a broad modernization program at the company's Altoona, Pa. mill. Other new equipment includes two Johnson slashers, four 200-gallon cookers made by Piedmont Machinery & Dyeing Equipment Co., and an American Monorail overhead transport system for moving beams.

Completed at a reported cost of $1,000,000, the modernization of the Altoona mill included the building of an addition which brought floor area up to 95,000 square feet. The mill, which now has 322 looms and 220 workers, is devoted entirely to weaving solution-dyed fabrics. For quilling, 300 heads of

(Continued on Page 81)

Vicara in Woven Fabrics

(Continued from Page 59)

the very luxurious hand that Vicara will create in a fabric. The fact that Vicara is a versatile fiber also enables one to make fabrics that are firm or sheer, and still maintain and create a smooth silk-like luxurious hand. Here, again, the fibers with which Vicara is blended and the twist used affords the producer almost limitless opportunity for fabric creation. Vicara is very flexible in its end uses.

As in all fabrication, construction is very important. Properly constructed fabrics with Vicara can be obtained in women's wear or men's wear coatings that possess a real luxurious hand as well as a great suppleness and drape. By construction changes the luxurious hand can be maintained, but the fabric can be firm instead of supple. These qualities of luxurious hand with firmness or suppleness in drape can be maintained in coatings that feel zephyr like in weight right down through 6 oz. dress goods fabrics. All this can be obtained with Vicara blends if the constructions are properly made, if the yarn twists are right, and if Vicara has been blended with the right fibers and in the right percentages.

Of course, finishing and dyeing play a very important part in the completing of the fabric. It should be noted that Vicara acts like wool and dyes like wool. Vicara lends itself gracefully and readily to the many varieties of finishes. Here, again, let me stress the importance of good blending. For as you vary the types of finishes which may be found in dress goods, or suitings, sportswear, and coatings, either women's wear or men's wear, the success of the variety of finishes will often depend on a good uniform blend.

Vicara has much to offer the woven goods field in women's wear or men's wear, be it in formal dress, business wear, or sportswear. The hand of Vicara is always right if Vicara is handled right.

Outlook in textile marketing *(Continued from Page 30)*

Smaller Gains Due in Some Markets— Textile markets are always in a state of flux. While some markets are opening up, like that for acrylic fibers in fur fabrics, there are other cases where a rapid rate of expansion begins to slow down.

Two such cases seem likely to affect rayon staple fiber and nylon filament yarn during 1956.

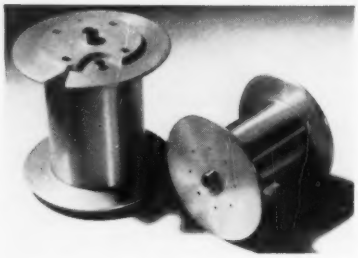
There has been an extremely rapid expansion of demand for rayon staple in tufted rugs, and for nylon filament yarn in tire cord. In both cases there is evidence that the rate of gain is being reduced.

For rayon in tufted carpets, a high degree of saturation has already been reached, with extensive displacement of cotton, and retailers seem to have ample supplies on hand.

Nylon filament yarn has experienced such a rapid expansion in tire cord during the last two or three years that a slower gain might reasonably be expected. In addition, greatly improved rayon cord will have an impact on tire-cord economies in 1956.

Tufted carpets, though providing less rapid expansion for rayon, may however become a more important market for nylon. So far the amounts of nylon used, and the percentages, have been comparatively small.

New MACHINERY and PRODUCTS



New Bobbin for Nylon

A durable bobbin made from a single piece of aluminum has been introduced by Allentown Bobbin Works, Inc., Allentown, Pa. According to the manufacturer, the new bobbin will withstand the tremendous pressures of Helanca or other continuous filament nylon yarns. The new bobbin comes both as a one-piece aluminum take-up bobbin and as a transfer take-up bobbin.

The manufacturer points out that the new bobbin is made from one piece of metal. Consequently, there are no screws or threaded or fitted joints to make cracks that snag or break the yarn. The one-piece construction is achieved by a brazing operation at temperatures that cause the metal to flow into one continuous piece. Consequently, there are no possible openings between heads and barrel. A bulletin on the new bobbin can be obtained.

For further information write the editors.

New Selvage Post Attachment

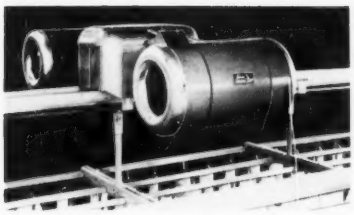
Draper Corp. now has available a new #3 Selvage Post Attachment for any 2 or 3-roll adjustable top Draper temple. According to the manufacturer, the device is an improved mechanism for producing better selvages on many weaves.

The mechanism is mounted on a torsional rubber bearing located below the cloth line. This feature, coupled with rugged construction, virtually eliminates wear on component parts. No lubrication is required, therefore danger of oil stains on cloth is greatly reduced. Longer life and lowered maintenance costs are assured because of the construction of this mechanism, Draper reports.

For further information write the editors.

Bahnson Traveling Cleaner

The Cross-Jet, a traveling cleaner for spinning rooms has been announced by The Bahnson Co., Winston-Salem, S. C. Self-propelled on standard weight creel-mounted track, or on a single rail suspended track, the Cross-Jet's four revolving nozzles and four directional nozzles attack lint from many directions to provide complete 360° clean-



ing of all overhead surfaces, including ceiling, pipes, fixtures, columns, lights, as well as the spinning frame. According to the company, the number of units and track requirements are cut 50 percent, thus the cleaner needs only a ½-horsepower motor.

For further information write the editors.

New Steel Heddle Products

Steel Heddle Manufacturing Co., is offering a stainless steel Drawtex Heddle, available in either .008″ or .010″ thickness, 14″ long. The company has also made available their heddle rod support known as Stehedco Rigid Rod Hook, which connects the frame stick to the heddle rod and a machine threaded nut on the outside of the frame stick.

To fill the need for a tension washer to handle the very fine low twist filament yarns, Steel Heddle is offering a polishing process which is said to insure a completely uniform and perfectly flat surface. Variations in tension are, according to the company, reduced on each individual end as well as over the creel as a whole.

For further information write the editors.

Acropak Spinner Bobbins

Acrometal Products, Inc., is offering spinner bobbins, made of aircraft aluminum alloys. The bobbins are said to be precision balanced to eliminate vibration; lightweight to increase operating speed; and dimensionally stable under high temperature steaming.

For further information write the editors.

News of the Industry

Statistics Course Offered

The Institute of Statistics at N. C. State College is sponsoring a 7-day intensive short course in Statistical Methods for Research Workers in Industry and the Physical Sciences, Feb. 12 through Feb. 18, 1956. Registration fee is $100 and enrollment will be limited to the first 50 applicants.

American Cyanamid Fellowship

Establishment of its third two-year graduate fellowship at the Institute of Textile Technology, Charlottesville, Va., was announced by American Cyanamid Co. The grant, amounting to $5,000, is for a course of studies leading to a M.S. degree in textile technology. William Russell Etchells, a graduate of New Bedford Institute of Textiles and Technology, has been selected to study under this fellowship.

Celanese Offers Larger Beams to Tricot Knitters

The Celanese Corp. of America will offer the tricot trade knitting sets on 21" x 84" beams. According to the company, the advantages realized on trial shipments to date indicate improvements on three counts: simplified handling, improved quality, and increased production.

Stauffer and Consolidated Chemical Merge

The merger of Consolidated Chemical Industries into Stauffer Chemical Co. was approved by stockholders of both companies at special meetings held in San Francisco.

Hilton-Davis Scholarship

The Hilton-Davis Chemical Co., a division of Sterling Drug, Inc., has provided a 4-year scholarship to the Textile School of Clemson College. The grant amounts to $1,600, and will be payable over the 4 years of college attendance.

New Celanese Lab

Celanese Corp. of America is setting up development laboratories at their marketing department in Charlotte, N. C. The move is intended to consolidate sales personnel and technical service facilities drawn from their New York City, Summit, N. J., Hopewell, Va., and Burlington, N. C. offices.

Enka Cuts Nylon Staple Prices

American Enka Corp. has reduced the prices of Nylenka type 6 nylon staple from 25 to 30 cents a pound. The revised prices are 3 denier, semi-dull $1.25; 6-denier, bright $1.25, and 8, 10 and 15 deniers, bright $1.20. Previously, all deniers were $1.50.

Columbia Mills to Expand

Columbia Mills, Inc., has announced a program of plant expansion to meet the rising demand for their products. Several hundred thousand dollars have been appropriated for this purpose. Part of the sum will go toward new equipment and modernization of facilities in the Minetto plant. Another share of the appropriation will be used to add equipment in the company's aluminum window screen departments in Los Angeles and Minetto. Their Lattiswood plant in Wilkes-Barre, Pa., will also benefit from the appropriation.

Personal Notes

Clarence B. Moss, who recently announced that he had become a representative of Belding Corticelli, has clarified this statement by a further report that he continues his connection with the Synthane Corp., his former employer. In the future, he will serve as a manufacturers' agent for Synthane in addition to representing Belding Corticelli. He will continue at his present address, Arcade Building, Elizabethton, Tenn.

J. E. Clark has been elected treasurer of The Duplan Corp. and **William A. Wood** has been appointed sales manager of the throwing division.

G. Stewart Parker

G. Stewart Parker has been named sales staff manager of the Pneumafil Corp.

Thure Bylund has been transferred from Curtis & Marble Machine Co.'s Worcester, Mass. plant to its Greenville, S. C. sales office.

William R. Landa has been named president of Burlington Export Co., a newly formed member organization of Burlington Industries. The company also announces that **Thomas S. Tolar** and **W. C. Harris** have been made executive vice presidents and members of the Board of Directors of Pacific Mills.

D. B. Benedict was appointed a vice president of Carbide and Carbon Chemicals Co., Division of Union Carbide and Carbon Corp. **Birny Mason, Jr.,** was elected Secretary of Union Carbide and Carbon Corp. Carbide and Carbon also announces that new sales office has been opened in New Orleans, La.

Leon P. Brick

Leon P. Brick has been elected executive vice president and acting president of Onyx Oil & Chemical Co. The company also announces that **Paul D. Jacobs** has been made group leader of the textile application section of their research laboratory.

Aser R. Nurmi

Aser R. Nurmi has been made superintendent of the Covington, Va. rayon plant of Industrial Rayon Corp.

Deaths

Werner Meyer, textile expert and head converter for Travis Fabrics, Inc., on Nov. 7, 1955. He was 51.

Miscellaneous

The Retail Sales Division of **Travis Fabrics** has moved to its own quarters at 1412 Broadway, New York City.

New York offices of **Mooresville Mills,** formerly located at 350 Fifth Ave., were moved to 1430 Broadway last month.

U. S. MAN-MADE FIBER PRICES

This schedule lists the prices of yarns, staple and tow as reported by the producers in November, 1955. All prices are given as subject to change without notice.

RAYON FILAMENT YARN

American Bemberg

Current Prices

Regular Production Reel Spun Yarn

Den/Fil	No Twist Skeins	Twisted* Skeins & Cones	High Twist Skeins & Cones 8½ Turns	12 or 15 Turns	18 Turns
40/30	$1.45	$1.75			$2.03
50/36	1.20	1.35			1.72
65/45	1.10	1.25		$1.48	1.58
75/60	1.00	1.12		1.37	$1.37 1.49
100/74	.90	1.02		1.27	1.27 1.38
125/60		.99	$1.05		
150/120	.89	.96	1.08	1.25	
300/225		.87½			1.00

* Twisted includes twists up to 6 turns on 40 and 50 denier, and up to 5 turns on heavier deniers.

"44" HH Spool Spun Yarn

Den/Fil	No Twist Tubes	No Twist Beams	5 Turn Beams	5 Turn Cones	12 Turn Beams	12 Turn Skeins & Cones	15 Turn Skeins & Cones
40/30	$1.25	$1.25					
50/36	1.00	1.00					
65/45	1.04					$1.42	
75/45**	.94	.94	$1.05	$1.05	$1.31	1.31	$1.39
75/54	.92						
100/60**	.85	.85	.99	.99	1.23	1.23	1.23
150/90	.75		.79	.87		1.15	1.15
150/120	.79			.91			

** Bemberg Solution Dyed yarns are spun in 75/45 and 100/60 only. Black 15c extra; all other colors 35c extra.

Short Nubbi Yarn

Code	Den/Fil	No Twist Skeins	2½ Twist Skeins	2½ Twist Cones	5 Twist Skeins	5 Twist Cones	8½ Twist Skeins & Cones
1516	150/90	$1.04			$1.12	$1.12	$1.24
1517*	150/90	1.04			1.12	1.12	1.24
2000	200/120	.82			1.02	.92	
2025**	200/120	.82			1.02	.92	
3000	300/180	.82	$1.02	$ .92			
4000	400/224	.82	1.02	.92			
6000	600/360	.82	1.02	.92			
8000	800/450	.82	1.02	.92			

* Code 1517 can be run in warp or filling.

** Code 2025-Softer than 2000.

Terms: Net 30 days f.o.b. Shipping Point. Minimum freight allowed to consignee's nearest freight station East of the Mississippi River. To points West of the Mississippi River Minimum freight to Memphis, Tenn. allowed. Goods after shipment shall be at buyer's risk. Merchandise transported in seller's own trucks or those of its affiliates if sold f.o.b. delivery point.

American Enka Corp.

Current Prices

Standard Quality Yarns

Den./Fil.	Luster	Turns	Weaving Cones	Beams		Skeins	Cakes	Knitting Cones
50/18	E	5S	....	....		....	....	$1.48
75/10	B	3S + Z	....	....		....	$1.00	....
75/18	E	4S	....	....		....	....	1.14
75/30	B	4S	$1.09	$1.09		....	1.00	1.09
75/30	B	8S	1.14	....	14M	$1.29		1.14
					18M	1.24		
75/45	P,E	5S	1.09	1.09		....	1.00	1.09

Den./Fil.	Luster	Turns	Weaving Cones	Beams	Skeins	Cakes	Knitting Cones
100/40	B,E,	12S	....	....	....	....	1.14
100/40	P,E	5S + Z	....	....	....	....	.96
100/40,60	B,P	2.5S + Z	.96	.96	....	.88	.96
100/60	E	2.5S	.98	.98	....	.90	....
125/40	E	3S + Z	.88	....	....	....	.88
150/40	B,P,E	2.1S + Z	.83	.83	Long .86 Short .91	.78	.82
150/40	B	8S	.89		Long .92 Short .97		....
150/90	E	2.1S	.84	.84		.79	....
200/40	P	3Z	....	....	....	....	.77
250/60	P,E	2.4Z	....	....	....	....	.70
300/50	B,E	3S	.68	.68	....	....	....
300/60	B,P,E	2.1S + Z	.68	.68	(8M) .71	.66	.68
300/60	B	3.5S + Z	.68	.68	....	.66	....
300/60	B	4.3S	.71	.71	....	.69	....
300/60	B	7S	78	....	....	....	.78
300/40/120 H.T.	B	2.5S	70	.70	....	....	....
450/80	B	3S	.65	.65	....	.63	....
600/80,120	B,E	3S	.64	.64	....	.62	....
900/120	B	3.4S	.63	.63	....	.61	....
900/120 H.T.	B	3.4S	.65	.65	....	.63	....

Tinted yarns $.05 additional.

B—Briglo. P—Perlglo (semi-dull). E—Englo (dull). H.T.—High Tenacity. Jetspun (colored yarns).

"Jetspun" Colored Yarns

Den./Fil.	Tenacity	Turns	Weaving Cones	Beams	Cakes	Colors
100/40	Regular	2.5S	$1.31	$1.31	....	All
100/60	Regular	4S + Z	....	....	$1.23	All
150/40	Regular	2.1S	1.18	1.18	....	All
300/40	Regular	3.4S	1.03	....	....	All
450/80	Regular	3.0S	1.00	....	....	All
600/80	Regular	3.4S	.99	....	....	All
900/120	Regular	3.4S	.98	....	....	All
300/40	High T	3.4S	1.05	....	....	All
600/80	High T	3.4S	1.01	....	....	All
900/120	High T	3.4S	1.00	1.00	....	....

Terms: Net 30 days F.O.B. Enka, North Carolina or Lowland, Tennessee. Minimum common carrier transportation charges prepaid to first destination on or east of the Mississippi River.

American Viscose Corp.

Effective March 14, 1955

(Revised April 1, 1955)

Graded Yarns

Denier	Filament	Type	Short Skeins	Long Skeins	All Cones Beams Tubes	Cakes
50	20	Bright & Dull	$	$1.51	$1.48	$1.37
60	10	Bright	....	....	1.33	1.22
75	10-30	Bright	1.16	1.12	1.09	1.00
75	30	Dull	....	....	1.09	1.00
100	14-40	Bright	1.04	.99	.96	.88
100	60	Dull	....	....	.98	.90
125	50	Bright	....	....	.88	.82
150	24-40-60	Bright & Semi-Dull	.91	.86	.83	.78
150	40	Dull	....	....	.83	.78
150	90	Dull	....	....	.84	.79
200	44	Bright	.85	.80	.77	.73
250	60	Semi-Dull & Dull	.77	.73	.70	.68
300	44	Bright & Dull	.74	.71	.68	.66
300	234	Dull	....	....	.70	.68
450	100	Bright	....	.67	.65	.63
600	100	Bright	....	.66	.64	.62
900	60-100-150	Bright	....	.65	.63	.61
1200	75	Bright	....	.62	.60	....
2700	150	Bright	....	.65	.63	....

Extra Turns Per Inch

100	40	Bright 6-Turns	$1.16	$1.11	$1.08	$1.00
150	40	Bright 6-Turns	1.01	.96	.93	.88
300	15	Bright 5-Turns	....	....	.73	....
300	44	Bright 6-Turns	....	.81	.78	.76
600	30	Bright 5-Turns	....	.71	.69	.67

Rayflex Yarns

150	60	Rayflex	....	.86	.81
300	120	Rayflex	....	.70	.68
375	120	Rayflex	....	.69	.67
450	120	Rayflex	....	.67	.65
600	234	Rayflex	....	.66	.64
900	350	Rayflex	.67	.65	.63

Thick and Thin Yarns

150	40	Bright & Dull	....	1.07	....
150	90	Bright & Dull	....	1.07	....
200	75	Bright & Dull	....	1.00	....
300	120	Bright & Dull	....	.90	....
450	100	Bright & Dull	....	.87	....
490	120	Bright & Dull	....	.90	....
900	350	Dull	....	.95	....
920	120	Bright & Dulll	....	.95	....

Trade LITERATURE

The following trade literature has been received during the past few months and may be obtained by writing to the firms mentioned.

Acids

Brochure "Emeryfacts, Specifications and Characteristics" containing revised information on their entire line of products.—Emery Industries, Inc., Dept. 5, Carew Tower, Cincinnati 2, Ohio.

Air Conditioning Units

Bulletin No. 8127 describing a new line of central-station, cabinet-type units.—American Blower Corp., Detroit 32, Mich.

Calenders

Bulletin T-103 on their open-side frame, pneumatically loaded, 15 to 60 ton, multiple roll calenders.—McKiernan-Terry Corp., Textile Machinery Div., 94 Richards Ave., Dover, N. J.

Coloring Anodized Aluminum

Booklet on the latest developments in this field.—Sandoz Chemical Works, Inc., 61 Van Dam St., New York 13, N. Y.

Everglaze

Folder No. 5-1955 on their Everglaze Minicare in resort fashions, showing actual fabric samples.—Joseph Bancroft & Sons Co., Wilmington, Del. or Everglaze Marketing Div., 1430 Broadway, New York, N. Y.

Humidity Controllers

Bulletin 2273 describing their new electronic "Humistat".—American Instrument Co., Silver Spring, Md.

Instrumentation

Folder on their line of instruments for the textile industry, including their Lapcheck, Tension Analyzer, Imperfection Counter and Uniformity Analyzer.—Brush Electronics Co., 3405 Perkins Ave., Cleveland 14, Ohio.

Bulletin F-5608-1 on their ac and dc measuring, indicating, signalling and recording instruments.—Barber-Colman Co., Wheelco Instruments Div., Rockford, Ill.

Oleic Acids

Booklet titled "Emersol Oleic Acids" on their evaluation, properties and uses.—Emery Industries, Inc., Dept. 5, Cincinnati 2, Ohio.

Organic Chemicals

Catalog on their organic chemicals produced in commercial quantities.—Antara Chemicals, Sales Div. of General Aniline & Film Corp., 435 Hudson St., New York 14, N. Y.

Silicates

Newly revised pocket manual reviewing its complete line of specialized sodium silicate chemicals.—Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio.

Viscose Filament Yarns

The following deposit charges are made on invoices:

Metal Section Beams	$170.00 each
Wooden Section Beams	55.00 each
Wooden Section Beam Crates	30.00 each
Metal Section Beam Racks	75.00 each
Metal Tricot Spools—14" flange	30.00 each
21" flange	60.00 each
Metal Tricot Spool Racks—14" flange	135.00 each
21" flange	100.00 each
Wooden Tricot Spool Crates	20.00 each
Metal Tricot Beams—(32" flange)	150.00 each
Metal Tricot Beam Racks—(32" flange)	75.00 each
Cloth Cake Covers	.05 each

Same to be credited upon return in good condition—freight collect.
Terms: Net 30 days.

Celanese Corp. of America

Current Prices
Effective March 14, 1955

Den. Fil. Twist	Beams	Cones	Cakes	Non Shrunk Tubes
75/30/3 Bright	...	$1.03	$.95	...
100/40/3 Bright	...	.88	.83	...
100/40/5 Bright	...	.94	.89	...
100/60/3 Bright	...	.89	.84	...
150/40/3 Bright	$.81	.79	.74	...
150/40/5 Bright	...	.83	.78	...
150/40/8 Bright	...	.89	.84	...
150/40/0 Bright (Non Shrunk)	...	.63	...	...
300/50/3 Bright	.67	.66	.64	...
300/50/0 Bright (Non Shrunk)	...	.58	...	...
100/60/5 Dull	...	.94	.89	...
100/60/0 Dull	...	.85	...	...
150/40/3 Dull	...	.79	.74	$.70
150/40/0 Dull (Non Shrunk)	...	.63	...	...
150/90/3 Dull	...	.82	.77	...
250/60/0 Dull (Non Shrunk)	...	.62	...	...
250/60/3 Dull	...	.70	...	.65

#52 Thick and Thin Rayon

150/60/3 Bright	...	1.07	...	...
450/120/3 Bright	...	.87	...	...

Terms: Net 30 days. Prices per pound F.O.B. shipping point, lowest transportation allowed to destination in U.S.A. east of the Mississippi River.

Note: Prices on unlisted items can be obtained upon request.

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.
Current Prices

Bright and Dull

Den.	No. of Fils.	Turns per In.	Cones Beams & 2# Tubes	Textile "Cordura" Skeins	Cakes	Cones Beams & 2# Tubes	Skeins	Cakes
40	20	3	...	...	...	$1.80	...	$1.80
50	20	3	$1.48	...	...	1.50	$1.50	1.50
50	35	3	...	...	...	1.55	1.55	1.55
75	10	3	1.09	$1.12	$1.00	...	...	...
75	15	3	1.09	1.12	1.00	...	...	...
75	30	3	1.09	1.12	1.00	...	...	...
100	15	3	.96	.99	.88	...	...	...
100	40	3	.96	.99	.88	...	...	...
100	60 Brt.	3	.96	.99	.88	...	...	...
100	60 Dull	3	.98	1.01	.90	...	...	...
125	50	3	.88	.90	.82	...	...	...
150	40	3	.83	.84	.78	...	...	...
150	60	3	.83	...	...	.84	.85	.79
150	90 Dull	3	.64	.85	.79	...	...	...
200	35	3	.77	.79	.73	...	...	...
300	20	3	.68	.71	.66	...	...	...
300	50	3.5	.68	.71	.66	...	...	...
300	120	3	...	...	...	.69	.72	.67
450	72	3	.65	.67	.63	...	...	...
600	96	3	.64	.66	.62	...	...	...
600	240	3	...	...	...	.65	.67	.63
900	50	3	.63	.65	.61	...	...	...
900	144	3	.63	.65	.61	...	...	...
1165	480	3	...	...	...	.63	.63	.60
1800	100	3	.63	...	...	...	...	...
2700	150	3	.63	...	...	...	...	...
5400	300	3	.70	...	...	...	...	...

Thick and Thin

Den.	Fils.	Type	Turns per in. up to	Cones Beams & 2# Tubes	Skeins	Cakes
150	90	7	3	$1.07	$1.08	$1.07
200	80	7	3	1.00	1.01	1.00
200	90	19	3	1.00	1.01	1.00
450	100	7	3	.87	.88	.87
1100	240	50	3	1.30		1.30
2200	480	50	3	1.12		1.12

Fiber E

Den.	Fils.	Turns/In.	Cones, Beams & 2# Tubes
300	50	2.5	$ .88
900	50	2.5	.83
900	90	2.5	.83
2700	150	2.5	.88
2700	270	2.5	.88
5400	540	2.5	.88

2c per lb. additional for cones less than 3 lbs. and tubes less than 2 lbs.

Terms: Net 30 days.

Prices are quoted F.O.B. Shipping Point—lowest cost of transportation allowed or prepaid. To points west of the Mississippi lowest cost of transportation allowed or prepaid to Mississippi River crossing.

Industrial Rayon Corp.

Effective March 10, 1955
(Revision of March 31, 1955)

Bleached Yarns

Denier	Filament	Turns per In.	Type	2.8 Lb. Cones	4.4 Lb. Cones	Beams	2.2 Lb. Tubes	4.4 Lb. Cones
100	40	2.5 "S"	Bright	.96		.96		
150	40	2.5 "S"	Bright	.83		.83		
150	40	2.5 "S"	Luster #4	.83		.83		
150	40	2.5 "S"	Bright intermediate strength	.84				
200	20	2.5 "S"	Bright	.77				
200	40	2.5 "S"	Bright	.77				
300	44	2.5 "S"	Bright	.68		.68		
300	80	2.5 "S"	Bright	.68		.68		
300	80	2.5 "S"	Luster #4	.68		.68		
300	80	2.5 "S"	Bright extra strong	.70		.70		
450	60	2.0 "S"	Bright		.65	.65		
600	90	1.5 "S"	Bright		.64	.64	.64	.64
900	50	2.5 "S"	Bright		.63	.63	.63	.63
900	150	1.5 "S"	Bright		.61	.61	.61	.61
1100	480	2.0 "Z"	Bright high tenacity		.62	.62	.62	.62

Terms: Net 30 days f.o.b. point of shipment; title to pass to buyer on delivery of goods to carrier. Domestic transportation charges allowed at lowest published rate to all points east of the Mississippi River.

North American Rayon Corp.

Current Prices
Effective December 15, 1955

First Quality Yarns	Den/Fil	Twist	Cones: Knitting*, Jacquard and Velvet Cones	Cones: No Twist Knitting Cones	Cones: Beams, Tubes** and Weaving Cones	Untreated Cakes
	75/30	3.5			$1.09	$1.00
	75/30	7			1.22	
	75/30	15			1.29	
Normal	75/30	20			1.32	
Strength Yarns	100/40/60 Brt.	3.5			.96	.88
NARCO	100/40/60	12			1.14	
	125/52	3	$.88		.88	.82
	125/52	10			1.05	
	150/42	3	.82		.83	.78
	150/42	0		$.63		
	150/60	3			.83	
	300/75	3	.68		.68	
	300/75	0		.58		
	300/75	6			.78	
	600/98	3	.64		.64	
	900/46	2.5	.63		.63	
	1800/92	2.5	.63		.63	
Semi-High	300/75 Brt.	6			.79	
Strength Yarns	300/75	3			.69	
NI-NARCO						

* Oiled Cones .01 per pound extra for Graded Yarns only.

** 1 lb. tubes $.02 per pound extra for Graded Yarns only.

Terms: Net 30 days f.o.b. shipping point. Minimum freight allowed to consignee's nearest freight station East of the Mississippi River. To points West of the Mississippi River minimum freight to Memphis, Tenn. allowed. Goods after shipment shall be at buyer's risk. Merchandise transported in seller's own trucks or those of its affiliates if sold f.o.b. delivery point.

RAYON HIGH TENACITY YARN and FABRIC

American Enka Corp.

Effective August 1, 1951

Tempra (High Tenacity)

Denier	Elongation	Beams & Cones
1100/480	Low	$.62
1230/480	High	.62
1650/720	Low	.61
1820/720	High	.61
2200/960	High & Low	.60

Suprenka (Extra High Tenacity)

1650/720	Low	*.64
1820/720	High	.64

* Beams Only.

Terms: Net 30 days, f.o.b. Enka, North Carolina, or Lowland Tennessee; minimum freight allowed to first destination east of the Mississippi River.

TRADE LITERATURE

Ultrasonic Equipment

Bulletin DR-400 descriptive of their ultrasonic cleaning unit. Acoustica Model DR-400 Vibrator, for chemical and textile processing.—Acoustica Associates, Inc., Shore Road, Glenwood Landing, L. I., New York.

Valve Positioner

Bulletin F 5991-1 on their "Throttltrol".—Barber-Colman Co., Rockford, Ill.

V-Belts

Catalog V-55 covering their complete line of "Mor-Grip" V-Belts.—Maurey Manufacturing Corp., 2907 South Wabash Ave., Chicago 16, Ill.

Vibration Mountings

Catalog No. FP-55 on their Finnflex "floating pillow" mountings.—T. R. Finn Co., Inc., 200 Central Ave., Hawthorne, N. J.

Weaving Machines

Textile Job Report No. 9 on their Warner & Swasey-Sulzer Weaving Machines.—Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.

Other Literature

Corn Starch

Booklet available from Corn Industries Research Foundation, Inc., 3 E. 45th St., N.Y. 17, N.Y.

Index of Literature

Bulletin 100-D lists all literature put out by Minneapolis-Honeywell Regulator Co., Industrial Div., Phila. 44, Pa.

Principle of Continuous Yarn Testing

Booklet written by A. H. Milnes—Available from Stellite American Corp., 60 E. 42nd St., New York, N. Y.

Water Pollution Abatement

Manual available from Mfg. Chemists' Ass'n, Inc., 1625 Eye St., N.W., Washington, D. C.

U. S. Testing Co.

Booklet, "Selected Scientific and Engineering Tables and Data", available from H. M. Block, V. P., U. S. Testing Co., Hoboken, N. J.

Reference Set for Microscopy

Bulletin A-55 available from R. P. Cargille Laboratories, Inc., 117 Liberty Dy., New York 6, N. Y.

Diamond Alkali Co.

Bulletin describing literature put out by Diamond Alkali Co., Cleveland 14, Ohio.

"Becco Echo"

Folder listing Becco products and processes — available from Becco Chemical Div., Food Machinery and Chemical Corp., Buffalo, N. Y.

Saco-Lowell News

Folder describing repairs of Saco-Lowell machinery—available from Saco-Lowell Repair Sales Div., Biddeford, Me.

American Viscose Corp.

Effective October 4, 1950
(Revised October 4, 1954)

Super Rayflex

Den.	Fil.	Twist	Turns	Beams	Cones
1650	980	O		$.64	$.64
1650	980	Z	4.1	.64	.64

Tire Yarn

1100	490	Z	3.2	.62	...
1650	980	Z	3.2	.61	...
1650	980	O		.61	.61
2200	980	O		.60	.60

High Strength

1150	490	Z	2.5	.62	.62
1230	490	Z	3.6	.62	.62
1875	980	Z	3.6	.61	.61

Tire Yarn and High Strength Yarns are sold "Not Guaranteed for Dyeing."

Tire Fabric

1100/490/2	$.72
1650/980/2	.695-.73*
2200/980/2	.685

* Price determined by production factor.

Super Rayflex Fabric—add .03 to the above fabric prices.

The following deposit charges are made on invoices:

Beams	$55.00 each
Crates	30.00 each
Fabric Shell Rolls	3.50 each

Same to be credited upon return in good condition—freight collect.

Terms: Net 30 days.

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

"Super Cordura"

Denier	Filament	Turns/in.	Beams	Cones & Tubes
1100	480	2.5	.71	.71
1250	480	2.5	...	.71
1650	720	up to 2.5	.64	.64
1900	720	2.5	...	.64
2200	960	up to 2.5	.63	.63
2450	960	2.5	...	.63

Cordura

1650	720	0	.61	...
2200	960	0	.60	...

Beams containing ends of direct dyed yarn $3.30 per end extra.

Terms: Net 30 days.

Prices are quoted F.O.B. shipping point—lowest cost of transportation allowed or prepaid. To points west of the Mississippi lowest cost of transportation allowed or prepaid to the Mississippi River crossing.

Industrial Rayon Corp.

Effective March 10, 1955

Unbleached Bright High Tenacity Yarns

Den.	Fil.	Turns Per In.	4.4 Lb. Cones	Beams	2.2 Lb. Tubes	4.4 Lb. Tubes
1100	480	1.5 "Z"	.62	.62	.62	.62
1650	720	1.5 "Z"	.61		.61	.61
2200	720	2.0 "Z"	.60			
3300	1440	1.5 "Z"	.61		.61	.61
4400	1440	2.0 "Z"	.60		.60	.60
4400	2000	1.5 "Z"	.60		.60	.60

Standard skein lengths at 2,100 yards for 900 denier, 3,200 yards for 600 denier, 4,400 yards for 450 denier, and 6,500 yards for 300 denier —all at 2¢ per pound over cone prices.

900 denier 6 turns—Plus 8¢ for cones.

Luster #4 is semi-dull.

Terms: Net 30 days f.o.b. point of shipment; title to pass to buyer on delivery of goods to carrier. Domestic transportation charges allowed at lowest published rate to all points east of the Mississippi River.

North American Rayon Corp.

SUPER-NARCO

High Strength Yarns—		Cones	Beams
1650	720		$.61
1850	720	$.61	
Super High Strength Yarns—			
1650	720	.64	.64

Terms: Net 30 days, f.o.b. shipping point. Minimum freight allowed to consignee's nearest freight station East of the Mississippi River. To points West of the Mississippi River minimum freight to Memphis, Tenn. allowed. Goods after shipment shall be at buyer's risk. Merchandise transported in seller's own trucks or those of its affiliates if sold f.o.b. delivery point.

ACETATE FILAMENT YARN

American Viscose Corp.

Current Prices
Effective December 20, 1955

Bright and Dull

* Intermediate Twist

Denier & Filaments	Cones & 4-6 Lb. Tubes	Twister Tubes	Warps	Spinning Cones	Twist Warps
55/14	$.99	$.97	$1.00	$.93	$.94
75/20	.95	.93	.96	.89	.90
100/28	.91	.89	.92	.85	.86
120/32	.82	.80	.83	.76	.77
150/41	.74	.73	.75	.69	.70
200/54	.70	.68	.71	.66	.67
300/80	.66	.64	.67	.62	.63

* Standard Twist 2¢ additional.

Celanese Corp. of America

Current Prices
Effective December 19, 1955

Bright and Dull

	Intermediate Twist				Spinning Twist		
Denier and Filaments	4 & 6-Lb Cones	Beams	4 & 6-TM Tubes	4-Pound Cheeses	Cones	Beams	O Twist Tubes
45/13	$1.12	$1.13	$ ...	$ ...	$	$1.07	$
55/15	.99	1.00	...	...	.93	.94	.875
75/20	.95	.96	.93	...	.89	.90	.79
75/50	.97	.98	.95	...	...	...	.84
100/26-40	.91	.92	.89	...	.85	.86	.77
120/40	.82	.83	.81	...	.76	.77	...
150/40	.74	.75	.74	.74	.69	.70	.66
200/52	.70	.71	.70	...	.66	.67	...
300/80	.66	.67	.66	...	.62	.63	.60
450/120	.64	.65	.64	...	.60	.61	...
600/160	.62	.63	.62	...	...	...	...
900/80-240	.60	.61	.60	...	...	...	.58

3 to 5 Turns on Cones or Beams ... $.02 Additional

150 Denier 12 TM Tubes	.73
55/0/15Dull Tricot Beams	.935
2-Pound Cheeses	.01 Less Than 4-Pound Cheeses
2-BU and 4-BU Tubes	Same Price as 4 and 6-Lb. Cones

Terms: Net 30 days. Prices per pound F.O.B. shipping point, lowest transportation allowed to destination in U.S.A. east of the Mississippi River.

Prices subject to change without notice.

All previous prices withdrawn.

Note: Prices on unlisted items can be obtained upon request.

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

Acetate

Den.	Fil.	Intermediate Twist Cones	Intermediate Twist Beams	Low Twist Beams
55	18 or 24	$1.04	$1.05	$.99
55	36	1.06	1.07	1.01
75	24	1.01	1.02	.96
75	50	1.03	1.04	...
100	32	.95	.96	.90
100	66	.97	.98	...
120	40 or 50	.86	.87	.81
150	16	.82	.83	...
150	40	.78	.79	.74
200	60	.72	.73	.69
300	40 or 80	.68	.69	.65
450	120	.66	.67	.63
600	160	.64	.65	.61
900	70 or 240	.61	.62	.61

Terms: 30 days net.

Prices are quoted F.O.B. shipping point lowest cost of transportation allowed or prepaid. To points west of the Mississippi lowest cost of transportation allowed or prepaid to the Mississippi River crossing.

Low twist 0.5-0.80 turns per inch.

Intermediate twist—Twist above low twist, up to and including approximately 2.0 turns per inch.

Color—Sealed (except Black) $.33 per pound additional all packages.

Color—Sealed (Black) .13 per pound additional all packages.

Eastman Chemical Products, Inc.

Tennessee Eastman Co.

Effective Mar. 15, 1955

Estron Yarn, Bright or Dull — White

Denier & Filament	Regular Twist Cones	Intermediate Twist Cones	Intermediate Twist Tubes	Intermediate Twist Beams	Low Twist Cones	Low Twist Beams	Tubes Twist Zero
55/13	$1.01	$0.99	$ ...	$1.00	$0.93	$0.94	$0.88½
75/19	.97	.95	.93	.96	.89	.90	.81
75/49	.99	.97	.95	.98	...	...	...
100/25	.93	.91	.89	.92	.85	.86	.77
120/30	.86	.84	.82	.85	.78	.79	...
150/38	.76	.74	...	.75	.69	.70	.66
200/50	.72	.70	...	.71	.66	.67	...
300/75	.68	.66	...	.67	.62	.63	.60
450/114	.66	.64	...	.65	.60	.61	...
600/156	.64	.62	...	.63	.59	.60	...
900/230	.62	.60	...	.61	...	...	.58
900 & Heavier	...	...	...	...	...	...	.58

Current Prices

Chromspun—Standard Colors (Except Black)

Denier & Filament	Regular Twist Cones	Regular Twist Beams	Intermediate Twist Cones	Intermediate Twist Beams	Low Twist Cones	Low Twist Beams
55/13	$1.39	$1.40	$1.37	$1.38	$1.31	$1.32
75/19	1.36	1.37	1.34	1.35	1.28	1.29
100/25	1.30	1.31	1.28	1.29	1.22	1.23
150/38	...	...	1.11	1.12	1.06	1.07
300/75	...	...	1.01	1.02	.97	.98
450/114	...	...	.99	1.00	.95	.96
900 } 230	...	...	.94	.95	...	...

Current Prices

Chromspun—Black

Denier & Filament	Regular Twist Cones	Intermediate Twist Cones	Intermediate Twist Beams	Low Twist & Spun Twist Beams
55/13	$1.19	$1.17	$1.18	$1.12
75/19	1.16	1.14	1.15	1.09
100/25	1.10	1.08	1.09	1.03
150/38	.93	.91	.92	.87
200/50	.87	.85	.86	.82
300/75	.83	.81	.82	.78
450/114	.81	.79	.80	.76
900 } 230	.76	.74	.75	...

Prices are subject to change without notice.

Prices on special items quoted on request.

Terms: Net 30 days. Payment—U. S. A. dollars.

Transportation charges prepaid or allowed to destination in the United States east of Mississippi River. Seller reserves right to select route and method of shipment. If Buyer requests and Seller agrees to a route or method involving higher than lowest rate Buyer shall pay the excess of transportation cost and tax.

RAYON STAPLE and TOW

American Bemberg

Rayon Staple

A-7½ denier ..... $ .40

Terms: Net 30 days, f.o.b. Shipping Point. Minimum freight allowed to consignee's nearest freight station East of the Mississippi River. To points West of the Mississippi River minimum freight to Memphis, Tenn. allowed. Goods after shipment shall be at buyer's risk. Merchandise transported in seller's own trucks or those of its affiliates if sold f.o.b. delivery point.

American Viscose Corp.

Effective July 26, 1954

Rayon Staple

	Bright and Dull
Regular	$ .34
Extra Strength	
1.0 Denier	.38
"Viscose 32A"	.38
"Avisco Crimped"	
1.25 Denier	.36
3.0 & 5.5 Deniers	.35
8.0 & 15.0 Deniers	.37
"Avisco Smooth"	
8.0, 15.0 & 22.0 Deniers	.39
Short Staple Blend	.36

Rayon Tow

Grouped Continuous Filaments (200,000 Total Denier)	
1.5, 3.0 & 5.5 Denier Per Filament	.36
9.0 Denier Per Filament	.38
Grouped Continuous Filaments (4400/3000 & 2200/1500)	.65

Prices of other descriptions on request.

Terms: Net 30 days.

Celanese Corp. of America

Current Prices

Rayon Tow

1.5, 3, 5.5 (200,000 total denier) bright	.34
1.5, 3, 5.5 (200,000 total denier) dull	.35

Courtaulds (Alabama) Inc.

Effective November 2, 1953

Rayon Staple

	Bright	Dull
1½ and 3 denier	$.32	$.33

Available in 1½", 1-9/16" and 2".

"Coloray" Spun Dyed Rayon Staple

	1½-Den. 1-9/16"	3 Den. 2"	4½ Den. 6"	Price per Lb.
	(Code numbers for color & denier)			
Black	50	60	70	$.37
Tan	52	62	72	.39
Silver Grey	233	933	...	.39
Khaki	51	61	71	.40
Slate Grey	58	68	...	.43
Light Blue	12	47	34	.44
Sulphur	19	44	33	.44
Apple Green	17	45	37	.45
Peacock Blue	222	922	...	.46
Brown	55	65	75	.42
Medium Blue	15	48	35	.48
Dark Blue	16	49	36	.49
Indian Yellow	20	43	32	.49
Pink	21	42	39	.50
Turquoise	56	66	...	.50
Malachite Green	18	46	38	.51
Red	14	41	31	.56
Terra Cotta	8204	8219	...	.39
Medium Brown	8804	8819	...	.39
Hunter Green	5404	5419	...	.49

(In addition to the above, Black is also available in 3 den. 1⅛", 3 den. 1-9/16", 3 den. 2½", 4½ den. 2" and 4½ den. 4").

Terms: Net 30 days, f.o.b. LeMoyne, Alabama. Minimum transportation allowed to points in U.S.A. east of Mississippi River.

The Hartford Rayon Co.

Div. Bigelow-Sanford Carpet Co., Inc.

Rayon Staple

Effective December 1, 1955

Denier	Length	Luster	Crimp	Spinning System	Price
1.5	1½	Bright	No	Cotton	$.32
1.5	2	Bright	No	Cotton	.32
8.0	3	Bright	Yes	Cotton & Wool	.35
8.0	3	Dull	Yes	Cotton & Wool	.35
15.0	3	Bright	Yes	Cotton & Wool	.35
15.0	3	Dull	Yes	Cotton & Wool	.35
15.0	3	Dull	No	Wool	.39

Terms: Net 30 days. Prices are quoted f.o.b. shipping point, lowest cost of transportation allowed, or prepaid. To points West of the Mississippi, lowest cost of transportation allowed to the Mississippi River crossing.

Schwarzenbach

(Continued from Page 69)

Whitin Schweiter winders are used. For preparing specialty warps, the Altoona mill has a Reiner high speed warper and a Sipp-Eastwood creel.

Although Schwarzenbach established the mill in 1892, and it has been in continuous operation since then, none of the equipment in use today is more than seven years old. Robert M. Schwarzenbach, president of the company, led the effort to modernize the plant, acting on the theory that the Altoona area contained too many experienced textile workers for the company to consider moving south. Aided by an incentive pay system and the modernization program, labor productivity at the mill has tripled during recent years, Schwarzenbach reports.

ACETATE STAPLE and TOW

Celanese Corp. of America

Current Prices

Staple

Up to and including 8 denier per filament, bright and dull	$.37
All other deniers, bright and dull	.38
35 dpf flat filament staple, bright	.43

Celatow

Up to and including 8 denier per filament, bright and dull	.37
All other deniers, bright and dull	.38

Eastman Chemical Products, Inc.

Tennessee Eastman Co.

Effective February 28, 1955

Estron Staple

Deniers per Filament	Bright and Dull
2, 3, and 5	$.32 per lb.

Prices are subject to change without notice.
Prices on special items quoted on request.
Terms: Net 30 days. Payment—U. S. A. dollars.
Transportation charges prepaid on allowed to destination in the United States east of Mississippi River. Seller reserves right to select route and method of shipment. If Buyer requests and Seller agrees to a route or method involving higher than lowest rate Buyer shall pay the excess of transportation cost and tax.

NON CELLULOSIC YARN

ACRYLIC

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

"Orlon"

Denier	Price
75	$2.65
100	2.35
200	2.25

Terms: Net 30 days f.o.b. Lugoff, S. C.

NYLON

Allied Chemical and Dye Corporation

caprolan Tensile Tough Nylon

Effective December 1, 1955

Heavy Yarns

Denier	Filament	Turn/in.	Type**	Package	Price/lb.
2100	6 d/f	Nominal	HB	Parallel Paper Tube*	$1.38
2500	6 d/f	Nominal	HB	Parallel Paper Tube	1.38
5000	6 d/f	Nominal	HB	Parallel Paper Tube	1.38
15000	6 d/f	Nominal	HB	Parallel Paper Tube	1.38

Terms—Net 30 days.
These prices are subject to change without notice. All prices are quoted f.o.b. shipping point.
Freight equalized with the nearest nylon yarn producing plant by our route.
* Parallel Paper Tubes non-returnable, no charge.
** Type is used to describe luster, tenacity and size or oil content.
Type HB: High Tenacity, Bright.

American Enka Corporation

Nylenka Filament Yarn Prices

Effective December 1, 1955

Denier & Filament	Twist	Luster	Type	Tenacity	Package	Yarn Weight per Package	Price per Pound Std.	Price per Pound Substd.
840/140	0.5Z	Bright	9202	High	Pirns	2 Lbs.	$1.48	$1.35
840/140	0.5Z	Bright	9208	High	Cones	4 Lbs.	$1.48	$1.35
840/140	0.5Z	Bright	9302	High	Beams	As Required	$1.48	$1.35
210/34	0.5Z	Bright	9204	High	Pirns	2 Lbs.	$1.65	$1.55
210/34	0.5Z	Bright	9214	High	Cones	4 Lbs.	$1.65	$1.55
210/32	0.5Z	Bright	9212	High	Pirns	2 Lbs.	$1.65	$1.55
210/32	0.5Z	Bright	9216	High	Cones	4 Lbs.	$1.65	$1.55
200/32	0.5Z	Bright	9802	Normal	Pirns	2 Lbs.	$1.75	$1.55
100/32	0.5Z	Bright	9642	Normal	Pirns	2 Lbs.	$1.90	$1.75
50/13	0.5Z	Semi-dull	9442	Normal	Pirns	2 Lbs.	$2.15	$2.00
40/13	0.5Z	Semi-dull	9428	Normal	Pirns	2 Lbs.	$2.25	$2.05
40/8	0.5Z	Semi-dull	9432	Normal	Pirns	2 Lbs.	$2.25	$2.05
30/8	0.5Z	Semi-dull	9418	Normal	Pirns	1 Lb.	$2.70	$2.55
15/1	0.5Z	Semi-dull	9408	Normal	Pirns	1 Lb.	$6.00	$5.70

Terms: Net 30 days F.O.B. Enka, North Carolina. Freight charges to be equalized with charges from producing points of like materials located nearest to destination.
Pirns charged at $.25 each. Deposit refunded upon return of pirn in good condition. Cones are non-returnable. Beams (Domestic Price) at $220 each. Cradles (Domestic Price) for beams at $50.00 each. (Beams and cradles are deposit carriers and remain property of American Enka Corporation.)

The Chemstrand Corp.

Current Prices

Den.	Fil.	Twist	Type*	Pkge.	Standard Price/Lb.	Second Price/Lb.
10	1	O	SD	Bobbins	$9.00	$8.50
15	1	O	SD	Bobbins	6.00	5.70
15	3	Z	SD	Bobbins	6.00	5.40
20	7	Z	SD	Bobbins	3.50	3.30
30	10	Z	SD	Bobbins	2.70	2.55
30	10	Z	HSD	Bobbins	2.70	2.40
40	7	Z	SD	Bobbins	2.44	2.20
40	13	Z	SD	Bobbins	2.25	2.05
40	13	Z	D	Bobbins	2.35	2.05
50	17	Z	SD	Bobbins	2.15	2.00
70	34	Z	SD	Bobbins	1.90	1.75
70	34	Z	B	Bobbins	1.90	1.75
70	34	Z	HB	Bobbins	2.00	1.85
100	34	Z	HB	Bobbins	1.95	1.75
100	34	Z	SD	Bobbins	1.90	1.75
140	68	Z	SD	Bobbins	1.85	1.70
200	34	Z	B	Bobbins	1.75	1.55
210	34	Z	HB	Bobbins	1.65	1.55
260	17	Z	HB	Bobbins	1.80	1.60
840	140	Z	HB	Beams	1.48	1.35
840	140	Z	HB	Tubes	1.48	1.35

Terms: Net 30 days.
Note: All Standard Quality Yarn—No break.
Bobbins, tubes, beams, and crates for beams become the property of the yarn purchaser. Bobbins are invoiced at 25¢ or 45¢ each, depending on type; tubes are invoiced at 40¢ each; and beams and crates for beams are invoiced at $220 and $25 respectively.

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

Nylon Yarn Price List

Denier	Filament	Turn/In.	Twist	Type*	Package	Price/Lb.** 1st Grade	2nd Grade
7	1	0	O	200	Bobbin	$10.00	$9.50
10	1	0	O	200	Bobbin	9.00	8.50
12	1	0	O	200	Bobbin	8.00	7.60
15	1	0	O	200	Bobbin	6.00	5.70
15	1	0	O	670	Bobbin	6.10	5.70
20	7	½	Z	200	Bobbin	3.50	3.30
20	7	½	Z	670	Bobbin	3.60	3.30
20	20	¾	Z	209	Bobbin	7.00	.....
30	10	½	Z	100/200	Bobbin	2.70	2.55
30	10	½	Z	670	Bobbin	2.80	2.55
30	26	½	Z	200	Bobbin	2.85	2.70
40	1	0	O	100/200	Bobbin	4.25	4.00
40	7	½	Z	200	Bobbin	2.44	2.20
40	13	½	Z	100/200	Bobbin	2.25	2.05
40	13	½	Z	670	Bobbin	2.35	2.05
40	34	½	Z	200	Bobbin	2.40	2.20
50	17	½	Z	200	Bobbin	2.15	2.00
50	17	½	Z	670	Bobbin	2.25	2.00
60	20	½	Z	200	Bobbin	2.00	1.90
70	34	½	Z	100/200	Bobbin	1.90	1.75
70	34	½	Z	300	Bobbin	2.00	1.85
70	34	½	Z	670/680	Bobbin	2.00	1.75
80	26	½	Z	200	Bobbin	1.90	1.75
100	34	½	Z	200	Bobbin	1.90	1.75
100	34	½	Z	300	Bobbin	1.95	1.75
140	68	½	Z	100/200	Bobbin	1.85	1.70
140	68	½	Z	300	Bobbin	1.90	1.70
200	20	½	Z	100	Bobbin	1.90	1.70
200	34	¾	Z	100	Bobbin	1.75	1.55
200	68	¾	Z	200	Bobbin	1.75	1.55
210	34	¾	Z	300	Bobbin Beam	1.65	1.55
260	17	1	Z	300	Bobbin	1.80	1.60
400	68	¾	Z	100	Bobbin	1.65	1.50
800	140	½	Z	100	Bobbin	1.65	1.50
840	140	½	Z	300	Alum Tube Beam	1.48	1.35
Industrial Yarn						**Price/Lb.**	
15120	2520	0	O	300	Paper Tube	$1.38	

These prices are subject to change without notice.
Terms—Net 30 days.
All prices are quoted f.o.b. shipping point. Freight equalized with the nearest Nylon Yarn Producing Plant by our route.
Following are invoiced as a separate item:
Bobbins at 25 cents or 45 cents each depending on type.
Aluminum Tubes at 40 cents each.
Beams (Domestic Price) at $220.00 each.
Cradles (Domestic Price) for Beams at $115.00 each.
(Beams and Cradles are deposit carriers and remain the property of E. I. du Pont de Nemours & Co.)

Types

* Type is used to describe luster, tenacity, and size or oil content.
Type 100 Bright, normal tenacity.
Type 200 Semi-dull, normal tenacity.
Type 209 Semi-dull, normal tenacity, #S-139 spin finish.
Type 300 Bright, high tenacity.
Type 670 Dull, normal tenacity.
Type 680 Dull, normal tenacity.
** Based on nylon containing 4.5% moisture regain. Finish content is not included in billed weight.
in good condition. Cones are non-returnable.

Textile Machinery Shipped by Air

A shipment of air freight consisting entirely of textile machinery recently was flown from the U. S. to England by chartered airliner. The machinery was a Foster Model 102T Ban-Lon machine, an adaptation of The Foster Model 102 Cone Winder. The flight was made in 16 hours from Springfield, Mass. to Manchester. Weighing over six tons and equipped with 100 spindles, the machine is used to produce Ban-Lon crimped nylon filament yarn for stretch hose, sweaters, T-shirts and underwear.

Geigy Quarter Century Club

The Geigy Quarter Century Club (America) created in 1948, recently initiated four members who have reached a quarter century of service with Geigy Chemical Corp. Those initiated were: Miss Doris Stricklin, Secretary, New York; Mr. F. E. Sprock, Charlotte Sales; Miss M. Elizabeth Allinson, Secretary, Philadelphia; Mr. Robert H. Butler, N. E. Sales.

Improved Red Pigments

The Hilton-Davis Chemical Co. is showing three red pigments that are said to be drycleaning-fast. According to the company, Hiltone Red DCX is the first available brilliant red color possessing dry-cleaning properties that contain the particular yellow shade "so much in demand by the industry". Hilton is also offering Hiltone Red G pigment and Red BLC (ITR type), which has a blue shade. All the pigments are said to be fast to perchlorethylene dry cleaning and to have good wash and light fastness.

POLYESTER

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

"Dacron"

Denier	Filament	Turn/Inch		Tubes
70	34	0	Dull	2.45
70	34	0	Semi-dull & Bright	2.35
150	68	0	Semi-dull	2.25
220	50	0	Bright	2.20
250	50	0	Bright	2.15
1100	250	0	Semi-dull	1.75

Terms: Net 30 days f.o.b. Graingers, N. C.

NON CELLULOSIC STAPLE & TOW

ACRYLIC

The Chemstrand Corp.

Current Prices

"Acrilan"

2.0 denier Semi-dull staple and tow	$1.18
3.0 denier Bright & Semi-dull staple and tow	1.12
5.0 denier Bright & Semi-dull staple and tow	1.12
Hi-Bulk staple Semi-dull	1.12

Terms: Net 30 days. Freight prepaid to points east of the Mississippi River.

Carbide and Carbon Chemicals Co.

Div. Union Carbide and Carbon Corp.

Textile Fibers Dept.

Effective November 1, 1955

Dynel Staple

Natural Dynel	
3, 6, 12, and 24 Denier, Staple and Tow	$1.05 per lb.
Whitened Dynel, and Dynel Spun with Light Colors: Blonde, Gray, or Taupe	
3 and 6 Denier, Staple and Tow	1.20 per lb.
Dynel Spun with Dark Colors: Black and Brown	
3 and 6 Denier, Staple and Tow	1.30 per lb.

Prices are quoted f.o.b. South Charleston, W. Va.

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

"Orlon" Acrylic Staple

Denier	Price
2	$1.30
3	1.25

Terms: Net 30 days, f.o.b. Lugoff, S. C.
Lowest cost of transportation allowed or prepaid. To points west of Miss., transportation prepaid or allowed to Miss. River Crossing.

NYLON

American Enka Corp.

Nylenka (Nylon Six Staple)

Semi-Dull	
3 denier, 1⅛", 1½", 2", 2⅜", 3", 4½"	$1.25
Bright	
6 denier, 3", 4½"	1.25
10 denier, 3"	1.20
15 denier, 3"	1.20

Deniers and lengths not listed above are available upon special request.

Terms: Net 30 days F.O.B. Enka, North Carolina. Freight charges to be equalized with charges from producing points of like materials located nearest to destination.

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

Nylon Staple and Tow

Denier	Length	Type*	Price/Lb.**
1.5	1⅛"—1½"—2"—2½"	100/200	$1.30
1.5	1⅛"—1½"—2"—2½"	101/201	1.32
3.0	1⅛"—1½"—2"—2½"—3"—4½"	100/200	1.25
3.0	1⅛"—1½"—2"—2½"—3"—4½"	101/201	1.27
6.0	1⅛"—1½"—2"—2½"—3"—4½"	100/200	1.25
6.0	1⅛"—1½"—2"—2½"—3"—4½"	101/201	1.27
15.0	1½"—3"—4½"—6½"	100	1.20
15.0	1½"—3"—4½"—6½"	101	1.22

Tow price same as Staple for:

1.5 denier type 200 in 330,000 total denier
1.5 denier type 201 in 350,000 total denier
3.0 denier type 100/200 in 430,000 total denier
3.0 denier type 101/201 in 455,000 total denier
6.0 denier type 100 in 330,000 total denier
6.0 denier type 101 in 345,000 total denier
15.0 denier type 100 in 330,000 total denier
15.0 denier type 101 in 350,000 total denier

These prices are subject to change without notice.
Terms: Net 30 days.
All prices are quoted f.o.b. shipping point.
Freight equalized with Covington, Va. or Enka, N. C. by our route.

Types

* Type is used to describe luster, tenacity, not crimpset, or crimpset.
Type 100 Bright, normal tenacity, not crimpset.
Type 101 Bright, normal tenacity, crimpset.
Type 200 Semi-dull, normal tenacity, not crimpset.
Type 201 Semi-dull, normal tenacity, crimpset.
** Based on nylon containing 4.5% moisture regain.

Industrial Rayon Corp.

Effective November 23, 1955

Nylon Staple

1.5 denier	$1.30 per lb.
2, 3 and 6 denier	1.25 per lb.
8 and 15 denier	1.20 per lb.

Bright and semi-dull, required length.
Terms: Net 30 days f.o.b.

POLYESTER

E. I. du Pont de Nemours & Co.

Textile Fibers Dept.

Current Prices

"Dacron" Staple and Tow

Denier	Length		Price
1.5	1½" to 4½"	Semi-dull	$1.40
3.0	1½" to 4½"	Semi-dull	1.35
4.5	1½" to 4½"	Semi-dull	1.35
6.0	1½" to 4½"	Semi-dull	1.35

Terms: Net 30 days f.o.b. Graingers, N. C.

POLYVINYL ACETATE

American Viscose Corp.

Effective October 1, 1950

Vinyon Staple

3.0 denier ½" unopened	$.80 per lb.
3.0 denier 1¼", 2" opened	.90 per lb.
5.5 denier 1", 3½" opened	.90 per lb.

Terms: Net 30 days.

new Fabrics

New Fiber in First Use

A deep-pile fabric that is said to closely resemble fine fur has been introduced by the George W. Borg Corp., Delavan, Wis. The fabric, "Borglura", is made of B. F. Goodrich Chemical Co.'s dinitrile fiber, "Darlan".

Bondable Nylon Spinning Tape

The development of a bondable nylon spinning tape, for use as a spindle belt in textile mills, was announced recently by Burlington Narrow Fabrics, division of Burlington Industries. The tape, according to the company, was developed after careful study in their own mills of such problems as downtime, variable spindle speed, power losses and costs as they relate to spinning tape. "Burnyl-bond", is said to outlast traditional tapes 3 to 4 times, and because it is bondable, can be formed into an endless belt without distortion at the point of splicing. The splice can be taken apart and rebonded as well.

Fine-Wale Nylon Fabric

A DuPont nylon fabric of brushed tricot construction made in a fine wale effect reminiscent of corduroy is now being introduced in children's dresses and lounge wear. The fabric is said to be lightweight, yet full-bodied and drapable, and to be washable, with little or no ironing needed.

Plastic-Dot Fabric

Riegel Textile Co. is offering a fabric of heavy cotton permanently imbedded with many tiny plastic dots, for the purpose of creating a work glove with twice the wearability of any regular canvas glove. According to the company, 3,000,000 pair of work gloves of Riegel "Plastic-Dot" fabric have been used everywhere from factories and mines to farms and suburban gardens since 1952. Riegel is also offering children's sleepers with plastic-dot soles which cut down on slipping, and plastic-dotted pockets in work pants.

Dynel Safety Bag

A safety bag to enclose laboratory pressure bottles in boiling water baths has been developed by Flaherty Filter Fabrics. The bag is made of 100% Dynel, Union Carbide's acrylic fiber. According to the company, the Dynel bags are so rot-resistant and mildew-proof that users report regular savings over formerly used cotton bags.

PROTEIN

Charlotte Fibre Co.

Exclusive Agents for Snia Viscosa Italy "Merinova"
Effective January 1, 1954

Merinova Staple

3 Denier 1-9/16", 2-1/2" and 3"	$.81
5 Denier 1-1/16", 1-9/16", 2-1/2", 4" and 6"	.81
9 Denier 4"	.81
18 Denier 6", 2-1/2"	.81
60 Denier 14"	.85

Other lengths or deniers can be produced as requested.
Solution-dyed Merinova staple fiber.

Light colors	.90 per lb.
Medium colors	.95 per lb.
Dark colors	1.00 per lb.
French Combed Tops	1.10

Terms: Net 30 days. All prices are duty paid, landed free, freight prepaid to rail point nearest destination.

Virginia-Carolina Chemical Corp.

Fiber Division
Effective January 15, 1951

Vicara Staple

	Standard Crimp	Highly Crimped
3 Denier	$1.00 per lb.	$1.05 per lb.
5 Denier	1.00 per lb.	1.05 per lb.
7 Denier	1.00 per lb.	1.05 per lb.

Bleached Vicara Staple

	Standard Crimp	Highly Crimped
3 Denier	$1.10 per lb.	$1.15 per lb.
5 Denier	1.10 per lb.	1.15 per lb
7 Denier	1.10 per lb.	1.15 per lb.

Staple length ½ to 6 in.
Supplied in staple lengths or as continuous tow (270,000 filaments).
Terms: Net 30 days.
Prices f.o.b. Taftville, Conn. on 10% moisture regain basis.

Business Service Section

Exclusively for Business, Laboratory and Mill Services; Positions and Men Wanted; Business Opportunities; Mill Properties Wanted or For Sale; Reconditioned Machinery and Equipment, etc.

CLASSIFIED RATES
Per Inch
2 columns to the page, each column 8 inches deep

1 Inch	$8.00
2 Inches	15.00
3 Inches	22.50
4 Inches	28.00
5 Inches	35.00
6 Inches	42.00
7 Inches	49.00
8 Inches	52.00

FACTORY BUILDING AVAILABLE IN NORTH CAROLINA

Brick bldg. 10,000 Sq. Ft. Adjacent Southern R.R.; rail siding would be easy. Plenty of land all around. In city limits. Very ample water suppply. Formerly a hosiery mill—knitting dyeing & finishing. Excellent boiler, stoker fired. Plenty of good labor available. Also annex stock room.

WILL LEASE OR SELL

Box 762—Modern Textiles Magazine,
303 Fifth Avenue, New York 16, N. Y.

YARNS WANTED

Yarns of every description — surplus or obsolete — any form. Will pay cash.

J. C. YARN CO.

Established 1920 Tel.: CAnal 6-0955
109-111 SPRING STREET NEW YORK 12, N. Y.

FOR SALE

KENYON SPECIAL MODEL E MULTIPLE LAYER STEAM HEATED PIN FRAME, 1948 MODEL, INSULATED HOUSING. WIDTH RANGE 56" TO 146". COMPLETE WITH REEVES DRIVES, DOUBLE BATCHER, FOLDER, INSTRUMENTATION, VALVES AND MANY OTHER EXTRAS. EXCELLENT FOR RESIN CURING. AVAILABLE WITH OR WITHOUT 120" RODNEY HUNT PADDER FOR RANGE OPERATION. WILL DEMONSTRATE. Box 760, Modern Textiles Magazine, 303 Fifth Ave., New York 16, N. Y.

OVERSEER WANTED

"New American Mill Requires Overseer of Finishing"

Wanted Overseer of Finishing to take charge of Finishing Department of new American Mill in South America. Must have extensive experience in modern finishing equipment on rayons, wool blends and modern synthetics. Thorough knowledge of resins and resin application necessary. All travel expenses for man and family paid, plus customary foreign arrangements. Must be willing to train new inexperienced labor. Knowledge of Portugese or Spanish a help but not a necessity. Write full details to Box 761, Modern Textiles Magazine, 303 Fifth Avenue, New York 16, N. Y.

HELP WANTED

New American Mill in Brazil
Requires Synthetic Loomfixers and Teachers

Wanted two Draper XD Loomfixers and one Crompton & Knowles W Type Loomfixers will be required to fix and to teach local help. Knowledge of Portuguese or Spanish a help but not a necessity. Mill is located in large modern city, good living conditions. Mill will pay all travel expenses men and families to Brazil plus customary foreign service arrangements. Excellent opportunity for right men to join a new, growing organization. Applicants should have a broad knowledge of fixing on spun synthetics and wool blends. Knowledge of filaments a help but not a necessity. Write full details to Box 759, Modern Textiles Magazine, 303 Fifth Ave., New York 16, N. Y.

SURPLUS YARNS

Bought and Sold
Cotton — Rayon — Nylon — Wool — Etc.
— Purchasers of Obsolete Yarn Inventories —

FRANCES YARN CO.

31 East 27th St., New York 16, N. Y. Mu 3-9419

CONFIDENTIAL EMPLOYMENT SERVICE

We will welcome an opportunity to be of service, if you are available for a position in the textile industry. SEND US YOUR RESUME. Many attractive positions are open for top-notch men. No fee to be paid unless you accept employment through us. Negotiations are confidential.

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington St. Liberty 2-6547 Boston 8, Mass.
Over 55 years in business

SURPLUS RAYONS, ACETATES and NYLON YARNS WANTED

all deniers on cones, skeins or cakes,
small and large lots.
Also creel Cut-outs.

DORRINGER CO.

22 West 27th St. New York City
LExington 2-9324-9325

YARNS

All Kinds Any Quantity Bought and Sold

THE YARN EXCHANGE, Inc.
358 Fifth Avenue, New York 1, N. Y.
BRyant 9-9288

Calendar of Coming Events

JAN. 13—AATCC Philadelphia Section, Kugler's Restaurant, Philadelphia, Pa.
JAN. 20—AATCC Council Meeting, Hotel Statler, New York, N. Y.
JAN. 23-26—Plant Maintenance and Engineering Conference, Convention Hall, Philadelphia, Pa.
JAN. 25-27—Am. Assoc. Soap & Glycerine Producers Annual Industrial Convention, Hotel Waldorf Astoria, New York, N. Y.
JAN. 27—AATCC New York Section, Hotel Delmonico, New York, N. Y.
JAN. 30-31—Annual Meeting National Cotton Council, Biloxi, Missouri
FEB. 1—AATT Monthly Meeting, Builders Club, New York, N. Y.
FEB. 3—APS, Div. of High Polymer Physics, New York, N. Y. Symposium
FEB. 15-17—Seventh Annual Cotton Research Clinic, National Cotton Council, Pinehurst, N. C.
FEB. 24—AATCC New York Section, Hotel Delmonico, New York, N. Y.
FEB. 27-MAR. 2—ASTM Committee Week, Hotel Statler, Buffalo, N. Y.
MAR. 7—AATT meeting, Builders Club, New York, N. Y.
MAR. 13-16—ASTM, Committee D-13 spring meeting, Hotel Warwick, New York, N. Y.
MAR. 15-17—Annual meeting Am. Physical Society, Pittsburgh, Pa.
MAR. 22-23—Annual meeting Textile Research Institute, Hotel Commodore, New York, N. Y.

Index to Advertisers

(*See previous or subsequent issues)

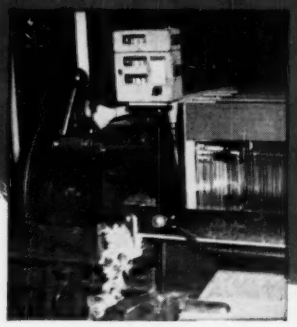
BUSINESS SERVICE


ALL
JACOBS
Loom Necessities
ARE
"Verybest"
THE BULLARD CLARK COMPANY
JACOBS
SOUTHERN
DIVISION
Charlotte, N. C.
NORTHERN
DIVISION
Danielson, Conn.

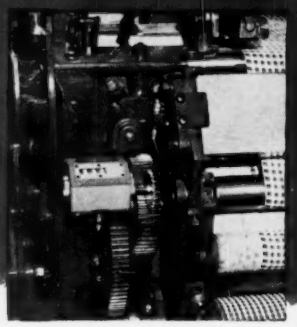
THIS COMPLETE VEEDER-ROOT "Countrol Package"

gives you AUTOMATIC UNIFORMITY all through your Mill . . . with New VEEDER-ROOT COUNTERS

. . . on Looms | **. . . on Frames**

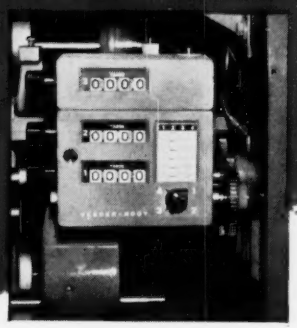


2-3-4 Pick Counter on Loom



Cut Meter on Loom

2-3-4 Hank Counter and Predetermining Counter on Drawing Frame



2-3-4 Yardage Counter and Predetermining Counter on Spinning Frame

On looms, 2-3-4 Pick Counters keep accurate production records and provide a basis for wage payment . . . while Cut Meters help maintain uniformity of cut-lengths of cloth, which is insisted upon today by the cutting-up trades.

On frames and other preparatory equipment, Hank, Yardage and Predetermining Counters hold can-variation to the minimum . . . and make it possible to run the largest economical packages.

This complete Veeder-Root "*Count*rol Package" adds up to better, automatic uniformity all through the mill. And that's why it pays *any* mill to get this Package of new and modern Veeder-Root Counters, when modernizing present machinery or buying new. Get in touch with the nearest Veeder-Root office *today*.

VEEDER-ROOT
INCORPORATED
"The Name that Counts"

HARTFORD 2, CONN. • GREENVILLE, S. C.

Chicago 6, Ill. • New York 19, N. Y.
Montreal 2, Canada • Dundee, Scotland
Offices and Agents in Principal Cities